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Australian Defence Force Requirements for a Group-feeding Ration Pack

Bianka Probert, Ajith Bandara and Vijay Jayasena¹

Human Protection and Performance Division
Defence Science and Technology Organisation

¹Curtin University of Technology, Western Australia

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ABSTRACT

This report details the results from three studies conducted on the acceptability and service suitability of the Combat Ration Five Man (CR5M), ADF's only group-feeding ration pack. Current information on the cost of production and current use of the CR5M and the Combat Ration One Man (CR1M) are also included. An important finding of these studies is that general acceptability, based purely on individuals' preferences for a food item, is not the only factor determining whether that food will be consumed. Behavioural factors, such as soldier attitude and meal occasion, and environmental factors, such as meal location and eating conditions, are also important. The most frequently requested changes to the CR5M are to substitute bulk meal pouches with individual meal pouches and to remove the need for group cooking. Both changes would effectively convert the CR5M into five bulk-packed CR1Ms. A need for a change to the configuration of the CR5M was indicated by respondents in all of the surveys. No single configuration was identified that best suits most users. Current usage rates (by units), consumption levels (by individual ADF members) and the opinions expressed by respondents in all surveys suggest that the CR5M is not fully meeting the perceived needs of the ADF. Support for the universal use of a combination of CR1M and Patrol Ration One Man (PR1M) in place of a group feeder was evident in all surveys. Rationing of units identified as users of the CR5M could be achieved with a combination of CR1M and PR1M. It is anticipated that the universal use of a CR1M/PR1M combination by all units would be more cost effective than the current system.

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Australian Defence Force Requirements for a Group-feeding Ration Pack

Executive Summary

This report summarises the findings from three studies investigating the acceptability and service suitability of the Combat Ration Five Man (CR5M), and provides recommendations for group feeding by Combat Ration Packs (CRPs). Current information on the relative cost of production and current use of the CR5M and Combat Ration One Man (CR1M) are examined.

An important finding from these studies is that general acceptability, based purely on individuals' preferences for a food item, is not the only factor determining whether that food will be consumed. Behavioural factors, such as soldier attitude and meal occasion, and environmental factors, such as meal location and eating conditions, are also very influential.

The results indicate that the CR5M is suitable in its present form. There is also evidence that acceptance of the CR5M could be improved. The most frequently requested change was to substitute bulk meal pouches with individual meal pouches. Another request was for the removal of the need for group cooking. Both of these improvement requests would effectively convert the CR5M into five bulk-packed CR1Ms.

The responses to questions about whether a group feeder should be configured for 3–10 persons and information on the composition of user groups indicate that there is a need for change to the 5-person configuration of the group feeder. No single configuration was identified that best suits most users.

Dissatisfaction with the CR5M as a group-feeder has led to a reduction in its use, with many units opting to use the CR1M and Patrol Ration One Man (PR1M) ration packs instead of the CR5M. The average yearly use, for the period June 2005 to July 2008, of the CR1M by the primary user of CR5M (1 Brigade) was 15% greater (approximately 2000 packs) than their use of the CR5M.

The results indicate that rationing of units identified as users of the CR5M could be achieved with a combination of CR1M and PR1M. It is anticipated that the universal use of a CR1M/PR1M combination of rationing to all units would be more cost effective than the current system due to a reduction in the wastage associated with the limited use of the CR5M. It would also be expected to reduce the cost associated with administration, tendering and logistics.

Replacements for food components that are repeatedly poorly rated for acceptability and/or have low consumption rates should be sought. Additional foods commonly used by individuals to complement rations (Jack Rations) should be investigated for inclusion in CRPs. When determining the suitability of a prospective ration component, influences, such as behavioural and environmental factors, should be investigated in addition to acceptability (general liking or disliking of a food) and consumption rates.

It is recommended that the ADF consider discontinuing the CR5M and that field feeding be achieved by a combination of 24-hour packs and fresh feeding. The body of the report contains further recommendations on changes to the group-feeder should it remain in service.

Authors

Bianka Probert

Human Protection and Performance Division

In 2008 Bianka graduated from Deakin University with a Graduate Diploma in Human Nutrition and in 2009 became a Registered Nutritionist with the Nutrition Society of Australia. In 1999 Bianka completed a BAsc (Hons) in biotechnology and biochemistry at LaTrobe University. Bianka has been employed at DSTO-Scottsdale since 1999 and working in the fields of food technology, microbiology, biochemistry and nutrition. Bianka's current focus is on improving the nutritional health of Army recruits.

Ajith Bandara

Human Protection and Performance Division

*Ajith graduated from Victoria University, Melbourne in 2009 with a PhD in molecular biology. His PhD research investigated stress responses of *Saccharomyces cerevisiae*. Ajith also has completed a BSc in agriculture and a MSc in plant genetics at the State University of Russia. He is a member of the Australasian Yeast Group and has contributed to microbial molecular biology research at Victoria University and University of Melbourne since 2001. As a scientist at DSTO he continues his research work in development of ADF feeding systems and biological studies to mitigate combat stress.*

Vijay Jayasena

Curtin University of Technology, Western Australia

Vijay graduated with a MSc in 1988 and a PhD in 1992 from Kansas State University. He has also completed a BSc (Hons) from the University of Peradeniya in 1981. From 1997–2001 Vijay was the head of Food Science and Technology at DSTO-Scottsdale. Vijay is currently an Associate Professor of Food Science and Technology at Curtin University. In 2004 Vijay was the recipient of the Researcher of the Year Award for the Division of Health Sciences.

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1. Introduction

There is evidence that the CR5M does not meet the operational requirements of the users [1-5]^{1,2}. Discussions on the future of the CR5M, during Australian Defence Force Ration Scale Committee meetings (2004 and 2005), resulted in the proposal that the CR5M be discontinued and that the CR1M be used in its place [2, 3]. Due to the underutilisation of the CR5M, DSTO Scottsdale has been tasked to identify the specific function and structure of a group feeding ration pack, to assist in the design of a group feeder that can best meet operational requirements.

Combat Ration Packs (CRPs) are used when the training or operational conditions preclude the use of fresh food or canned equivalents. Under all circumstances, the provision of fresh food to soldiers is a priority for the Australian Defence Force (ADF) [6]. Currently, the ADF use three types of Combat Ration Packs (CRPs): Combat Ration One Man (CR1M), Patrol Ration One Man (PR1M) and Combat Ration Five Man (CR5M). In the mid 1990s, the CR5M was introduced as a replacement for the Combat Ration Ten Man (CR10M) [7]. The CR10M had been found to be underutilised as a result of not meeting the end users' needs. A study investigating the acceptability and service suitability of the CR10M concluded that this ration was water inefficient, nutritionally inadequate, expensive and heavy [8].

The CR5M provides enough food for five people for one day with an average of 15 MJ of energy per person. It offers five menu options, which are nutritionally complete, providing sufficient energy and nutrients to meet the requirements of ADF members engaged in moderate physical activity (see Appendix A.1 for a copy of the 2008/2009 CR5M menu and instruction sheet). Although not usually required, there is provision to supplement the CR5M with a cereal adjunct such as bread, rice, pasta or noodles [6]. It is the only group-feeding ration pack issued to ADF units.

¹ The lack of acceptability and service suitability of the CR5M was highlighted over a number of years during the ADF Ration Scales Committee Meetings (2000–2005). Excessive waste due to difficulties in providing rations to units containing a number of members that did not divide neatly into the five person configuration and underutilisation of the ration indicated dissatisfaction with the group feeder.

² Interim feedback on the CR5M collected in 2002 by Land Headquarters indicated a number of issues with the acceptability and service suitability of the CR5M, which went some way towards explaining the underutilisation of this pack.



Figure 1: Current CR5M pack consisting of a variety of food items and equipment for the preparation and consumption of the food

In 1998 and 2003 DSTO Scottsdale conducted studies to investigate the user acceptability (largely in terms of organoleptic³ properties) of the CR5M, and to obtain opinions on how group feeding might best be achieved. In 2003 another study was conducted which aimed to investigate the service suitability of the CR5M for the current operational requirements.

The outcomes of the three studies have been previously reported to the client. The following is a formal presentation of the findings and provides recommendations for group feeding by CRPs. Current information on the relative cost of production and current use of the CR5M and CR1M are examined. A comparison of the CR5M with the current CR1M is also included.

2. Methods

2.1 Acceptability survey 1997/1998 procurement

In the later part of 1998, between the months of September and November, a survey to determine the field acceptability of the CR5M was conducted during field exercises in various locations in the Northern Territory, Queensland, Western Australia and Tasmania. Members of the Australian Regimental Army (ARA) and the Royal Australian Air Force (RAAF) participated in the study. The 1997/1998 procurement of the CR5M, Menus A to E, was used in the study. A copy of the Menus A to E is presented at Appendix A.3. The acceptability of all items, rate of consumption and discard rates were determined. The use of supplemental foods and appropriateness of packaging was also investigated.

The questionnaire (QCR5M) was designed by staff at DSTO Scottsdale and consists of 12 questions, as shown in Appendix B.1. Question 1 relates to the use and acceptability of food items specific to each menu, and question 2 relates to those food items common to all menus. Acceptability was determined according to a 9-point hedonic rating scale where 1 corresponds to 'dislike extremely' and 9 represents 'like extremely'.

³ Pertaining to sensory characteristics, for example, flavour, aroma, appearance and texture.

Consumption was determined based on the estimated amount of that item that was consumed by the respondent. Respondents were asked to indicate the amount consumed—0, 25, 50, 75 or 100%—with the option to indicate 100+% if more than one issue was consumed.

Average acceptability and consumption ratings were calculated from the frequency of responses to each question option and divided by the total number of responses recorded for that food item. The average acceptability and consumption ratings for each food item were categorised as low, moderate and high based on the criteria detailed in Table 1.

Table 1: Criteria for rating CRP food items based on their average acceptability and consumption ratings

Rating	Hedonic score	Amount Consumed
Low	< 5	< 50%
Moderate	5-7	50-70%
High	7-9	70-100%

Questions (3-6) aimed to collect information on supplemental food items, discarded and/or traded ration items and foods recommended by the users for inclusion in the CR5M. Questions 7 and 8 addressed acceptability, service suitability and preferred method of heating retort pouch meals. The data was interpreted based on the proportion of responses to the various options available per question compared to the total number of responses received.

2.2 Acceptability survey 2000/2001 procurement

Between February and July 2003 the CR5M/Bulk Feeding Acceptability questionnaire (CBA) (Appendix B.2) was completed by units in Far North Queensland, Northern Western Australia and East Timor. Questionnaires were sent via post or email and distributed to units during an exercise or field operation, during which time they were consuming the 2000/2001 procurement of the CR5M for at least three days. A copy of the 2000/2001 CR5M menu list is presented at Appendix A.2.

The CBA questionnaire was designed by DSTO Scottsdale with the assistance of Glen McPherson Consultancy. The questionnaire consists of 41 questions aimed at collecting information on the acceptability and consumption of the food items, the use of specific items (e.g. are main meals eaten hot or cold) and conditions of the operational/training exercise. General questions about the CR5M in regard to the use of additional foods (Jack Rations), user requirements for a group feeder and suggestions for improvement are also included. Acceptability was rated on a 5-point scale where 1 = 'very bad' and 5 = 'very good'. Consumption data was collected based on responses to the question 'Amount Consumed' with the optional answers of 'none', 'some' or 'all'.

The acceptability and consumption data on the various CR5M food items were converted to ratios for statistical analysis and subsequent interpretation. The acceptability results were derived from the ratios 'very good' + 'good' (favourable) responses to 'very bad' + 'bad' (unfavourable) responses. Consumption results were based on the ratios of the responses 'all' + 'some' to 'none'. Ratios below 1 indicate a low level of acceptability and consumption rates.

The data obtained for the other questions was interpreted based on the proportion of responses to each of the options available for that question.

2.3 Service suitability survey

The CR5M Acceptability and Serviceability questionnaire (CAS) (Appendix B.3) was distributed to Army units identified as regular users of the CR5M, between February and July 2003. This survey was specifically designed to investigate the service suitability of the CR5M. The aim was to capture information at the organisational, rather than end user level. For this reason the target audience was not the end users, but unit commanders involved in the organisation of rationing for field exercises and other operations.

The CAS survey was designed by DSTO Scottsdale with the assistance of Glen McPherson Consultancy. The questionnaire consists of 15 questions aimed at identifying the most desired properties of a group-feeding ration, the positive and negative attributes of the CR5M and how the CR5M is being used by military units.

Due to the limited number of military personnel who met the requirements of the target group, effort was made to ensure that as many questionnaires as possible were completed by appropriate ADF commanders.

2.4 Treatment of data

To assist in comparing the data from all of the surveys the food components were grouped according to food type, under the following headings: 'main meal items', 'snack items', 'drink items' and 'miscellaneous items'.

2.5 Statistical analysis

Statistical analysis of the data collected from the CBA and CAS surveys was conducted by Glen McPherson Consultancy. Descriptive statistics was used for the majority of the data due to the small numbers of responses in the groups of interest. When inferential statistics were appropriate, the nominal or ordinal categories for the responses required the use of non-parametric statistics for statistical testing:

- For responses with nominal categories, Chi-squared tests were applied to cross-tabulated data.
- For responses with ordinal categories, the Mann-Whitney U test was used to compare the medians in two groups.

To explore the role of more than two explanatory variables for binary responses, logistic regression analysis was used.

2.6 Comparison of the CR5M with the CR1M: production costs and food components

The most current data available to DSTO was used to compare the production costs of the CR5M and the CR1M. Data was provided by the Defence Materiel Organisation (DMO) and represents the average costs of all of the menus for the CR5M and the CR1M. Menus for the 2008/2009 procurement of the CR5M and the CR1M were used to compare the food items contained in each of the menu options of the CRPs.

3. Results

The QCR5M questionnaire was completed by 137 respondents. The small number of responses limit's the use of the data and may not be a true reflection of the overall user opinion of the CR5M. The data does provide useful information on the acceptability of the CR5M and is consistent with the information gathered from the two other surveys detailed in this report.

3.1 Acceptability survey 1997/1998 procurement

3.1.1 Main Meals

Generally the main meals rated well for both acceptability and consumption, with evidence that consumption rates for these products are higher than for other food items with similar acceptability (see sections 3.1.2, 3.1.3 and 3.1.4 for comparison). This is indicated by the tendency for the main meals to be eaten even if they have a low acceptability rating. For example Beef and Gravy, Baked Beans, and Lamb and Rosemary rated poorly for acceptability compared to the other main meals; despite this 79% or more of respondents indicated that they consumed these meals. This trend is in contrast to the positive relationship between the acceptability (liking) and consumption of food that has been recorded in a number of studies [9-12]. Salmon and Pasta Mornay rated low for acceptability and was poorly consumed. Reformulation of Beef and Gravy, Baked Beans, Salmon and Pasta Mornay, and Lamb and Rosemary may be appropriate, based on their relatively low acceptability ratings. Figure 2 presents a comparison of the acceptability and consumption results for the main meals.

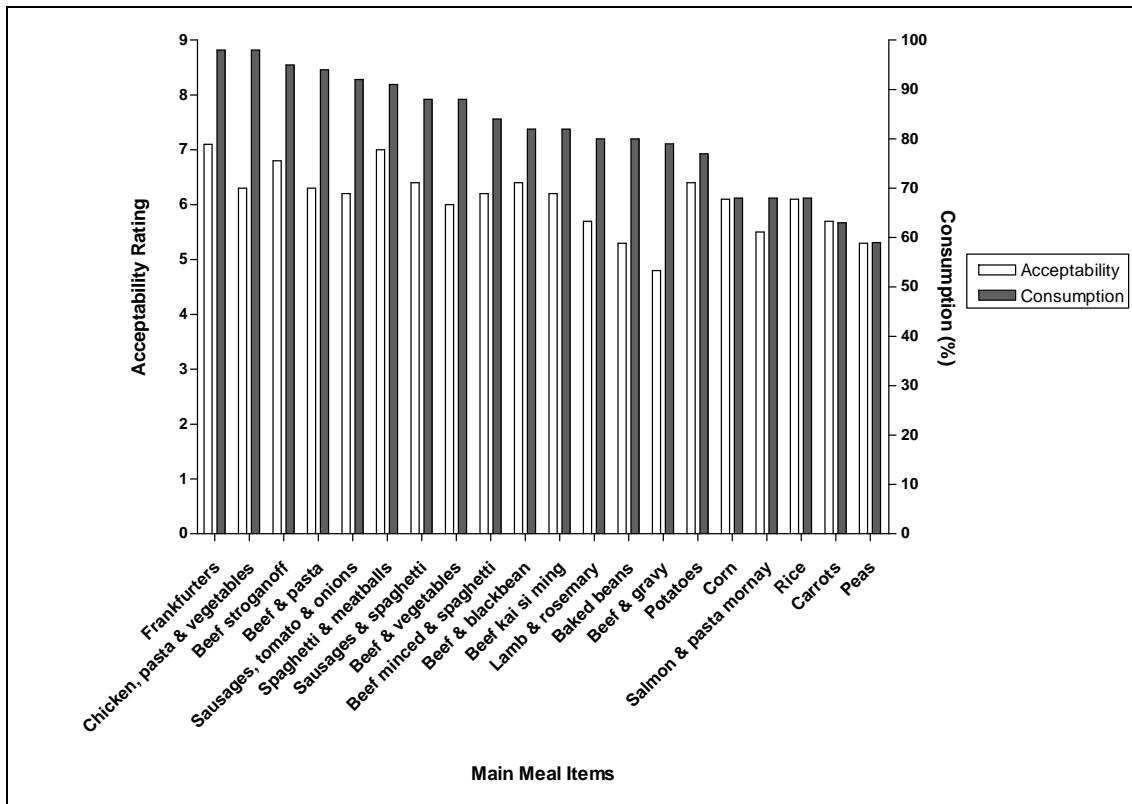


Figure 2: Comparison of the acceptability and consumption of main meal items

3.1.2 Snack Items

The Soup powders had the lowest acceptability ratings and were the least consumed snack items. The Biscuits and Muesli Bars showed a typical decline in consumption with a decrease in acceptability. The Tropical Muesli Bar was the least acceptable and least consumed. The Tropical Muesli Bar is the only flavour offered in two out of the five menus of the 1997/1998 Procurement of the CR5M, thus it is likely to be offered to consumers twice as many times as any of the other flavours. This may lead to boredom with this flavour and may explain the low acceptability and consumption ratings. As can be seen in Figure 3, snack items are generally consumed at a high rate if acceptable. If overall acceptability of these products can be increased it is likely to result in a greater consumption of these items.

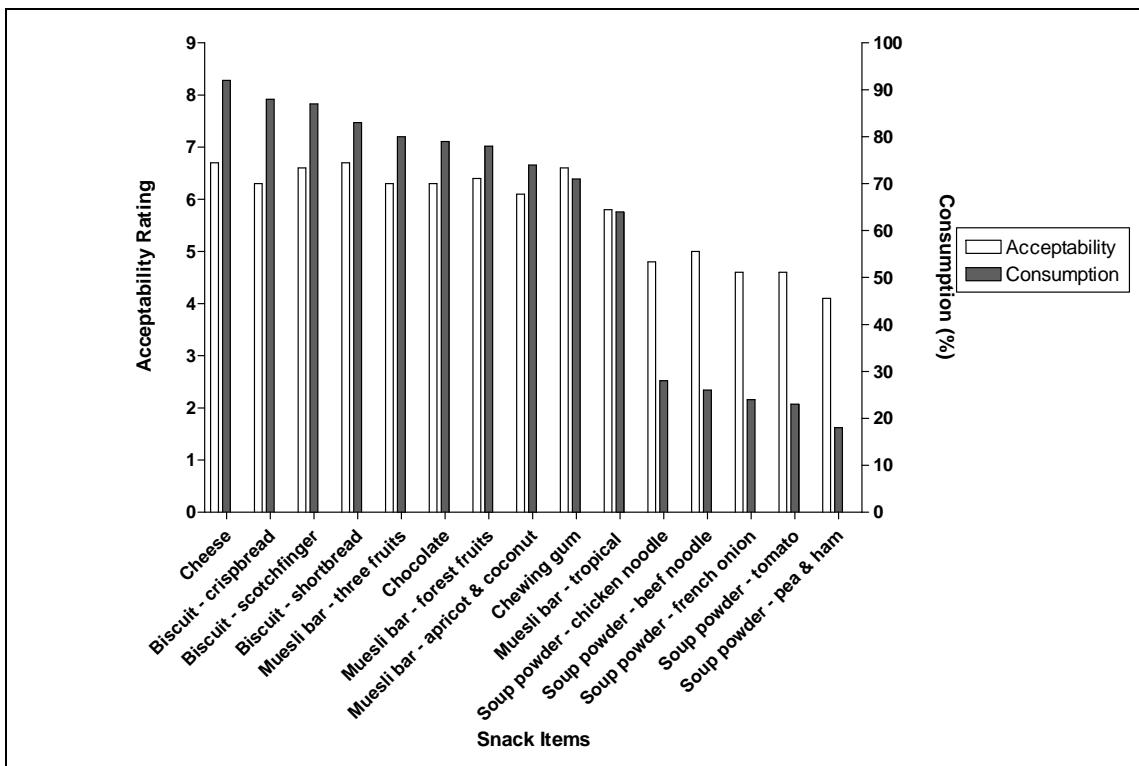


Figure 3: Comparison of the acceptability and consumption of the snack items

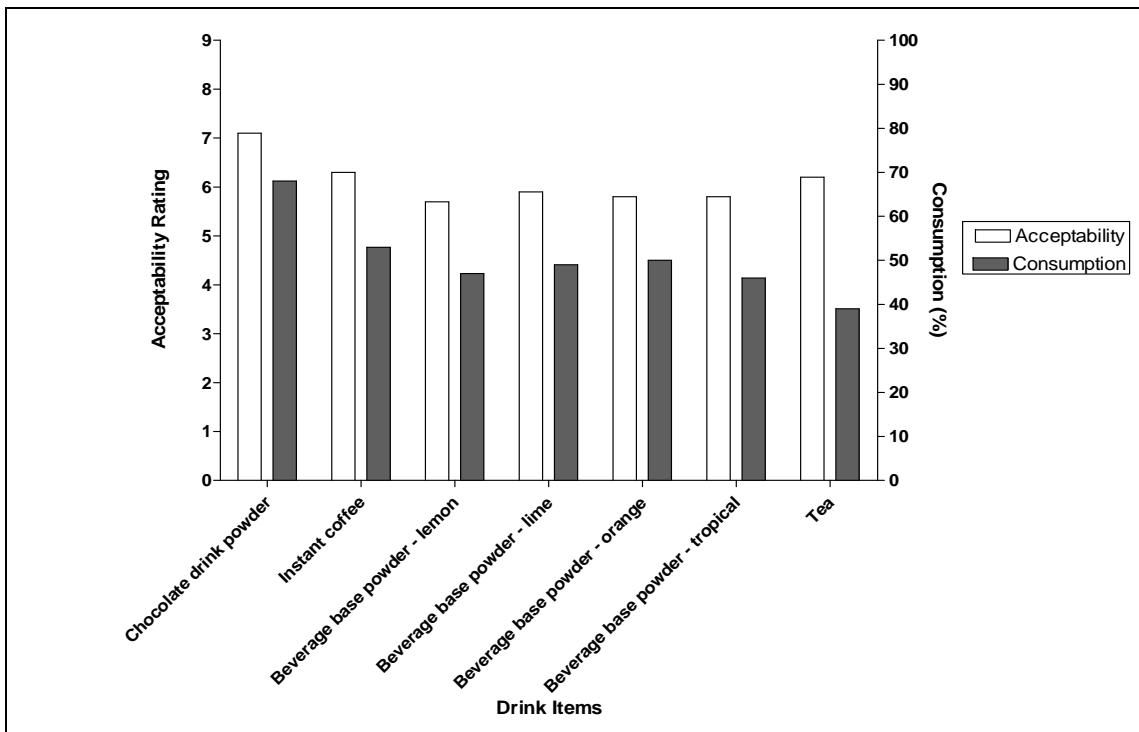


Figure 4: Comparison of the acceptability and consumption of the drink items

3.1.3 Drinks

As presented in Figure 4, Chocolate Drink Powder had relatively high acceptability and consumption rates compared to the other hot beverages. In contrast, Tea and Coffee had low consumption rates despite moderate acceptability scores. The Beverage Base Powders were the least acceptable and least consumed drink items.

3.1.4 Miscellaneous Items

'Miscellaneous items' includes the Jams, Butter Concentrate, Vegetable Extract, Fruit Pudding and the condiments. As displayed in Figure 5, the consumption rates of the Jams, Soya Sauce, Tomato Sauce, Butter Concentrate and Vegetable Extract was low despite moderate acceptability scores. Despite the moderate acceptability of the condiments, the consumption of most of these items, except for the Chilli and Tabasco sauces, was low. This is most likely a result of individual taste preferences, which would determine the addition of the condiments to a meal or drink. Figure 5 compares the acceptability and consumption of the miscellaneous items.

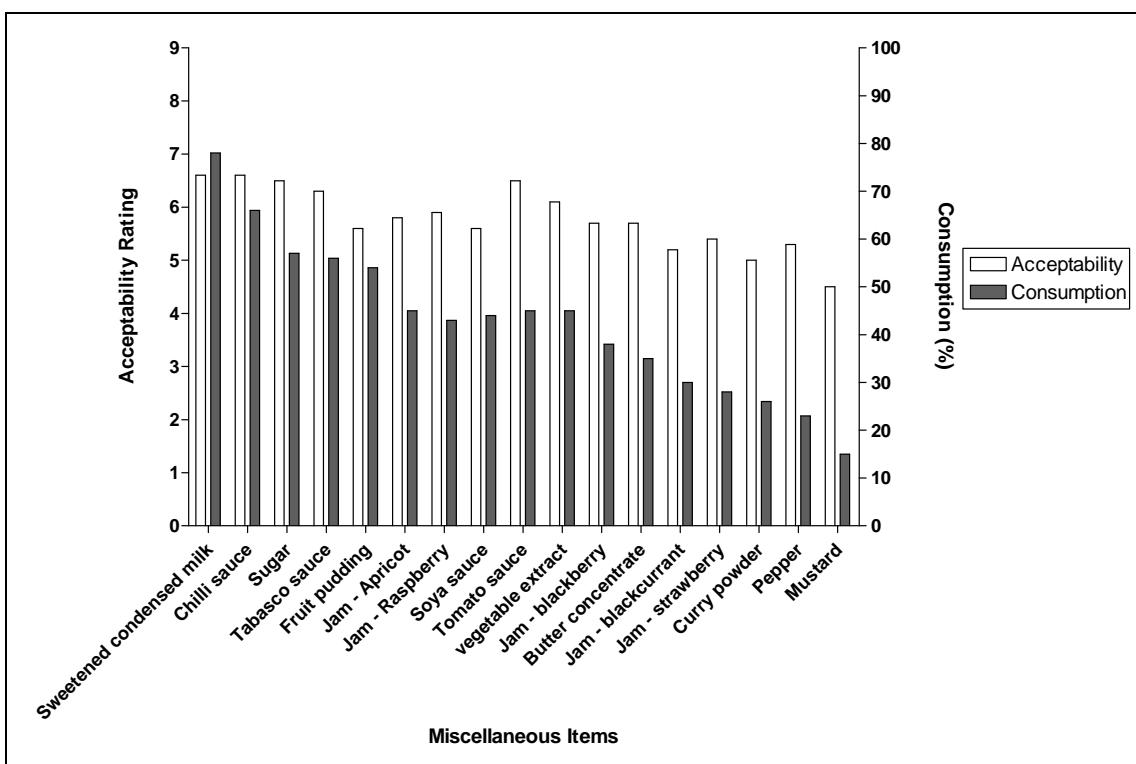


Figure 5: Comparison of the acceptability and consumption of miscellaneous items

3.1.5 Jack Rations

It is normal practice for ADF members to carry some additional food items — commonly known as 'Jack Rations' — into the field. Despite the fact that CR5M is designed to supply all energy and nutritional requirements of ADF members without any food supplementation, the

survey indicated that 79% of respondents carried Jack Rations. Bread was the most common additional food, with 36% of respondents indicating they carried Bread into the field. Other common Jack Ration items were instant noodles and pasta (20% and 18% of respondents, respectively).

3.1.6 Items Commonly Discarded

Beef and Pasta, Fruit Pudding, Salt and the Soups were the most commonly discarded items. Only a small percentage of respondents indicated that they discard any single item. For example, the Fruit Pudding was the most commonly discarded item, with 7% of respondents indicating they discarded this item. This was most likely due to the fact that the CR5M is a group feeder and if one person in a group likes a particular item, even though the rest of the group does not, that item will be retained by the group. Thus, if an item was discarded it strongly suggests that it was disliked by the entire group.

3.1.7 Packaging and Waste

The survey results showed that 75% of respondents agreed that CR5M packaging is strong enough for field use. Almost 60% of respondents indicated that the CR5M contains too much waste material. The continued use of the plastic inner containers is strongly supported, with 60% of respondents rejecting the proposal that they be replaced by fibreboard containers. This might be due to their use for the storage of various work related items, such as nuts and bolts, as has been observed during DSTO conducted field studies.

3.1.8 ADF User Group Configurations

On average, only 13% of respondents prepared CR5M as a group of five ADF members. In contrast, 24% prepared meals individually or in pairs. The majority of respondents, 63%, indicated that they prepared the CR5M as a group of either three or four diners. A ration designed to feed a smaller group or the universal use of the CR1M and PR1M may be more appropriate.

3.2 Acceptability survey 2000/2001 procurement

The aim for this study was to have 500 questionnaires completed. The number of responses (140) was only 28% of that desired. This was due to the limited usage of this CRP by the ADF, indicating that the CR5M was considered to be unsuitable as a group-feeding ration pack. Many traditional users of the CR5M who were participating in field exercises were found not to be rationed with the CR5M, opting instead to use the one-man ration packs. The low level of use of the CR5M by even the traditional users brings into question the degree to which the acceptability and consumption data is representative of the full spectrum of potential users. The information generated from the data still provides a valuable measure of the acceptability of the ration pack and is consistent with other findings reported herein.

3.2.1 Main Meals

As illustrated in Figure 6 almost all of the main meals were of moderate or greater acceptability to the majority of respondents, with Lamb and Rosemary, and Baked Beans being the least liked and least eaten. Beef Kai Si Ming was also poorly rated for acceptability; consumption of this meal was found to be moderate. The fact that for most items the ratio of favourable to unfavourable results, for both consumption and acceptability, is more than 1 and that the worst items are not excessively below 1, suggests that the main meal items are generally being eaten and enjoyed.

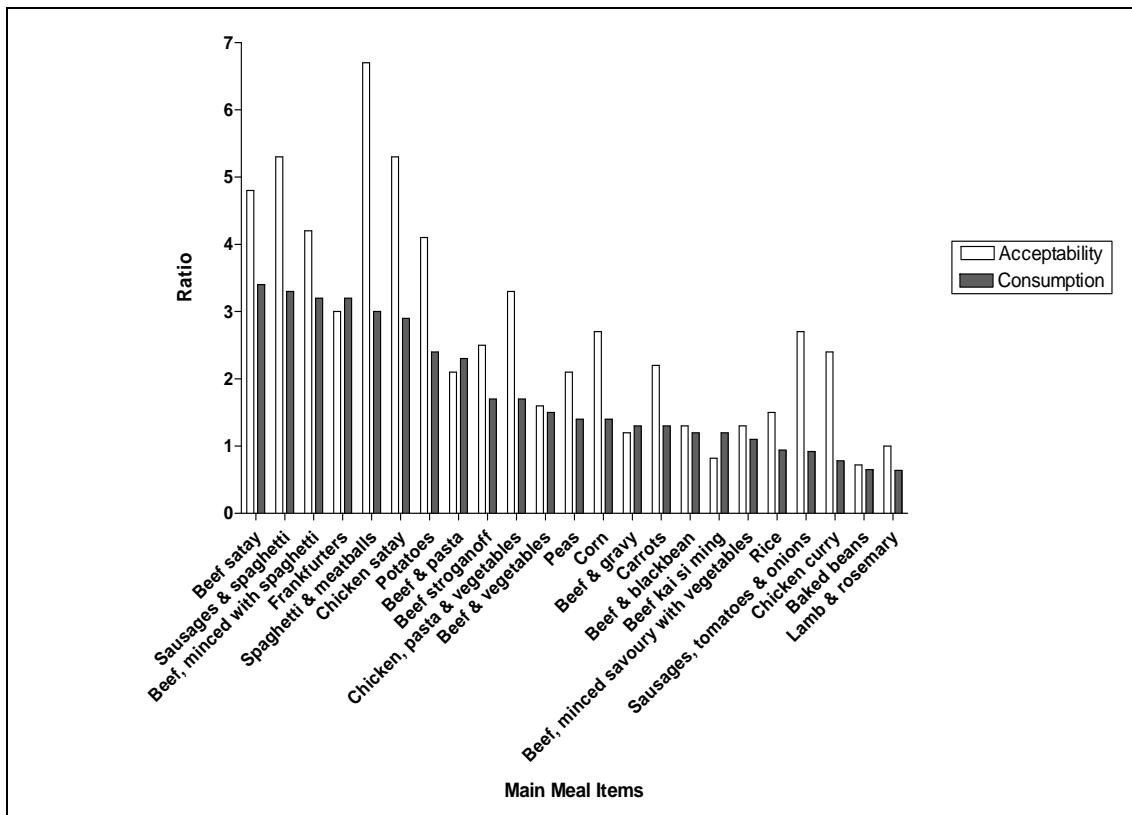


Figure 6: Comparison of the ratios for acceptability and consumption of the main meal items

3.2.2 Snack Items

Among the snack items, all Soups were rated low for acceptability and had the lowest consumption rates. The Anzac Muesli Bar was the least consumed and least acceptable item from the range of Muesli Bars and Biscuits. The greater acceptability of the snack items is positively related to their consumption—high acceptability associated with higher rates of consumption. This relationship is displayed in Figure 7, which presents a comparison of the acceptability and consumption data for the snack items.

3.2.3 Drink Items

The least acceptable drink items were the Sports Beverage Powders; these were also the least likely drinks to be consumed. The Coffee was also rated relatively low for acceptability, but had the highest consumption rate of all the drink items. The Chocolate Drink Powder had the highest acceptability; its consumption was second to that of the Instant Coffee. The higher consumption of the Coffee is most likely due to its use as an aid for reducing the symptoms of fatigue. These results illustrate the importance of determining both the acceptability and rate of consumption of a food item. Figure 8 provides a graphical display of the acceptability and consumption data for the drink items.

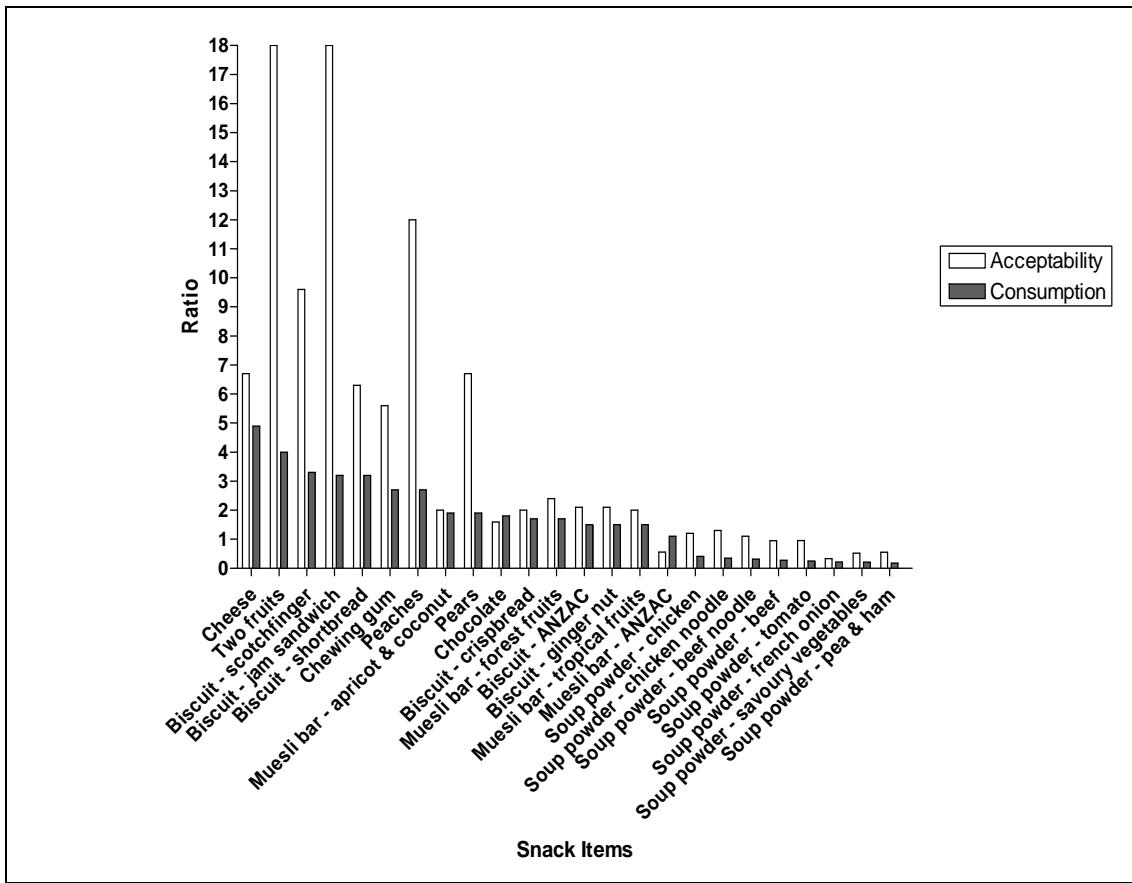


Figure 7: Comparison of the ratios for the acceptability and consumption of the snack items

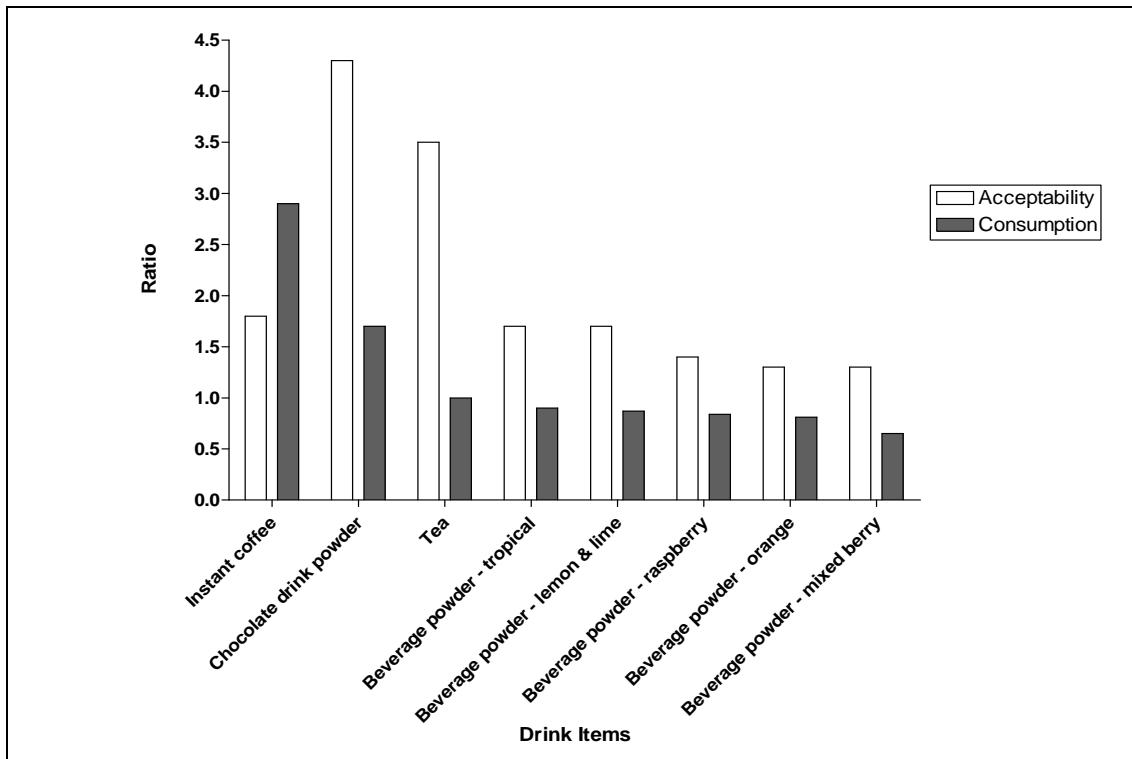


Figure 8: Comparison of the ratios for the acceptability and consumption of the drink items

3.2.4 Miscellaneous Items

Among the miscellaneous items—which includes Sweetened Condensed Milk, Fruit Pudding, Spreads and Condiments—the Curry Powder, Butter Concentrate and Vegetable Extract were rated low for acceptability. This is consistent with their low rates of consumption, with fewer than 50% of respondents indicating that they ate these items. In contrast to this observed relationship, the Fruit Pudding was rated high for acceptability but was poorly consumed. This may be due to the effort involved in the preparation and consumption of this food and the poor suitability of this item during certain operational/training events. The relative acceptability of the Fruit Spreads and the Soy Sauce was moderate but the relative consumption of these items was low. Figure 9 compares the results for the acceptability and consumption of the miscellaneous items.

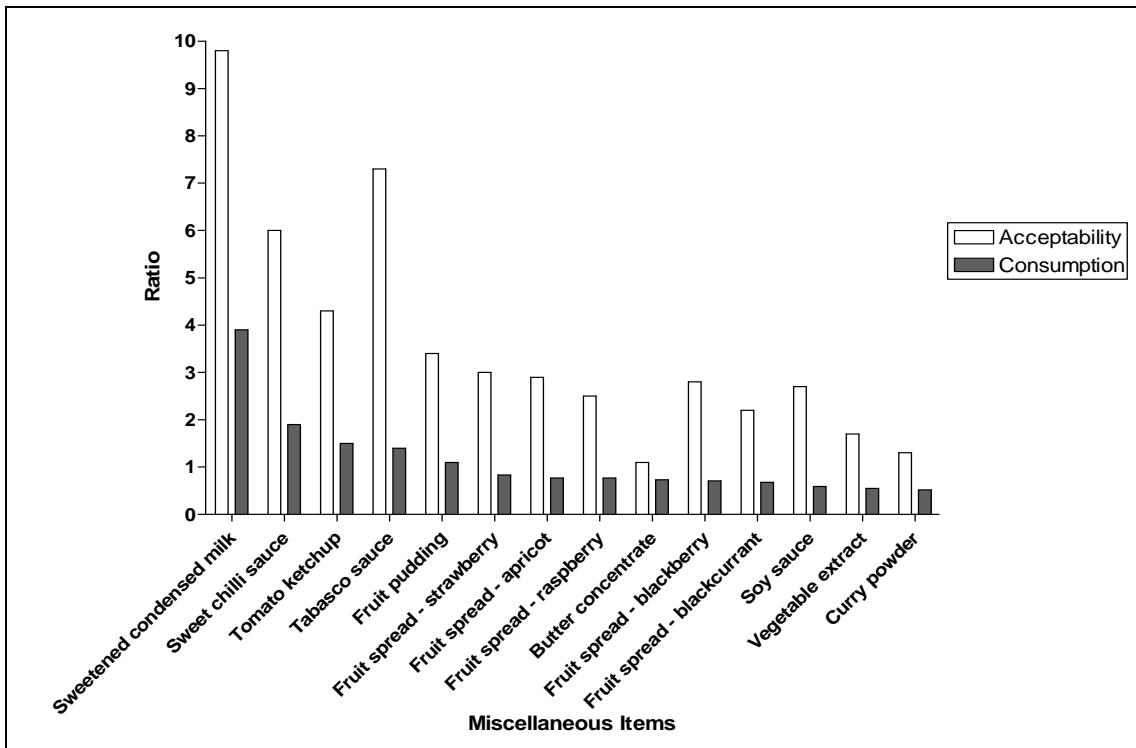


Figure 9: Comparison of the ratios for the acceptability and consumption of the miscellaneous items

3.2.5 Jack Rations

Jack Rations were taken by 88% of respondents and comprised a wide range of items. Muesli/oats with powdered milk, noodles, pasta, dried or processed meats, jubes (e.g. "Jelly Babies"), UHT drinks and flavoured biscuits were the most popular items used to supplement the CR5M. The popularity of the muesli/oat and milk mixes is also reflected in the finding that 72% of respondents identified a lack of foods recognisable as specific breakfast items. At the time of this study no specific breakfast items were provided in any of the CRPs. Since the 2006/2007 procurement of the CR1M, specific breakfast items have been included in a number of the menu options.

3.2.6 Climatic Influences

Units based in cooler climates ('cool units') tended to give more favourable assessments than those based in hotter climates ('hot units'). Members of hot units were twice as likely to indicate that there are insufficient snack items, while respondents from cool units were more likely to consume the Muesli Bars and to find these bars far more acceptable. Cool units were also much more inclined to consume all the fruit spreads and find them more acceptable. In terms of Jack Rations, hot units were more likely to take dried or processed meat, canned fish and flavoured biscuits compared to units in cooler climates.

A question on the need for a hot weather pack was included in this survey. Of those who responded to this question, 56% indicated their support for a hot weather ration. Responses to this question do not appear to relate to obvious operational differences. There were no significant differences between groups defined by length of exercise, percentage of days eating fresh food, number of hours per day in the field, or whether the climate was hot or cold.

3.2.7 General Acceptance and Consumption

There is no significant difference in the overall pattern of general acceptability of the CR5M between groups who engage in short- versus long-term field exercises.

The consumption of some beef dishes, all Muesli Bars and Sweetened Condensed Milk was greater for those who had little access to fresh food, as indicated by 25% or fewer of the exercise days including fresh food.

A small majority (54%) of respondents indicated that there is sufficient variety provided by the five menus of the CR5M, indicating a possible need for additional menus.

Overall, favourable responses were almost twice as common as unfavourable responses, with 24% of respondents providing a rating of 'bad' or 'very bad' and 43% providing a rating of 'good' or 'very good' for the acceptability of the CR5M. Responses varied substantially across units. The units showing the least favourable responses were 2 CAV and B SQN 3/4 CAV REGT, with only 40% of the members of these units indicating an overall assessment of 'good' or 'very good'.

Perhaps surprisingly, there is no greater acceptability of individual main meals, snacks, drinks or miscellaneous items by the favourable group, suggesting that overall response to the CR5M is more readily identified through consumption levels than acceptability. Respondents who provided a positive overall assessment of the CR5M generally ate all of the main meals and consumed more of the fruit-based snack, drink and fruit spread items compared to those who provided a negative overall assessment of the CR5M.

3.2.8 ADF User Group Configurations

Approximately 50% of respondents normally eat in groups of two ADF members, approximately 30% in groups of three and 16% in groups of four.

The provision of main meals as bulk packs was preferred by 48% of respondents compared to 29% who favoured individual serves, with 23% of respondents expressing no opinion.

There were inconsistencies in responses to questions on food preparation, which limits the usefulness of the information received. The most common form of preparation is by an individual for the group. Overall, hot meals were judged important by 83% of respondents. The importance of hot meals diminishes considerably when an individual prepares a meal for him/herself (37%) or when prepared by caterers (54%).

3.3 Service suitability survey

3.3.1 Participants

Complete questionnaires were received from 71 respondents. Although the initial aim was to target unit commanders rather than the end users of the CR5M, individuals meeting both categories participated in this study. Each group was approximately equally supported with 48% indicating a role in logistics and 52% indicating that they were users of the CR5M.

The number of respondents from individual units was generally small with more than 50% of units represented by only one respondent. For this reason it is not possible to assess whether responses are representative of the units or a reflection of the attitudes of individual respondents. Due to the small number of participants in this study, caution must be taken when considering the results of this survey, in particular as being representative of all users of the CR5M.

3.3.2 Use

Results indicated that 94% of respondents used the CR5M within the previous six months. Table 2 displays the number of CR5M packs used by respondents according to percentiles. The data indicates a median usage of 200 CR5Ms while only 10% of respondents used 4 or less and 10% used 1,535 or more CR5Ms in the previous six months.

Table 2: Percentiles for the number of CR5M used in the past 6 months by units under the command of respondents

Percentiles					
10	25	50	75	90	
4	10	200	938	1535	

3.3.3 Suitability

The CR5M was considered to be suitable in its present form by 66% of respondents. Among the respondents who currently use CR5M, 82% (37 of 45) indicated that, with improvement the CR5M would be suitable. The suitability of the CR5M ranged from 82% for motorised/mechanised units to 33% for infantry units. There were significant differences ($p < 0.01$) between the types of units and their support for the CR5M. The results suggest that the weight and bulk of the pack is problematic when load carriage is an issue. Table 3 displays a breakdown of the support for the current CR5M by type of unit.

Table 3: Relative support for the CR5M in its present form[#]

CR5M is suitable in its present form			
Unit Type	%	Number	Total
Infantry	33	6	18
Mounted/mechanised	82	31	38
Other	69	9	13
Total		46	69

[#] Two respondents that answered the question on the suitability of the CR5M have not been included in this table, since they did not indicate their unit type.

There were differences between those groups who found the CR5M 'suitable' and those who found it 'unsuitable'. Members of the 'unsuitable' group were:

- Five times more likely to recommend removal of the need for group cooking
- Four times more likely to recommend a decrease in weight
- Three times more likely to recommend the substitution of bulk meal pouches with individual meal pouches
- Six times more likely to agree that there should be no requirement for water in food preparation other than for drinks
- Additionally, all members of the 'unsuitable' group agreed that the pack should be more compact, while only 67% of the 'suitable' group agreed with this.

The greatest differences between the groups who find the CR5M 'suitable' and 'unsuitable' is the need for group cooking and the replacement of bulk meals with individual serves. As displayed in Figure 10, approximately half of the respondents indicated that the most important improvement that could be made to the CR5M would be replacing bulk meals with individual meal pouches.

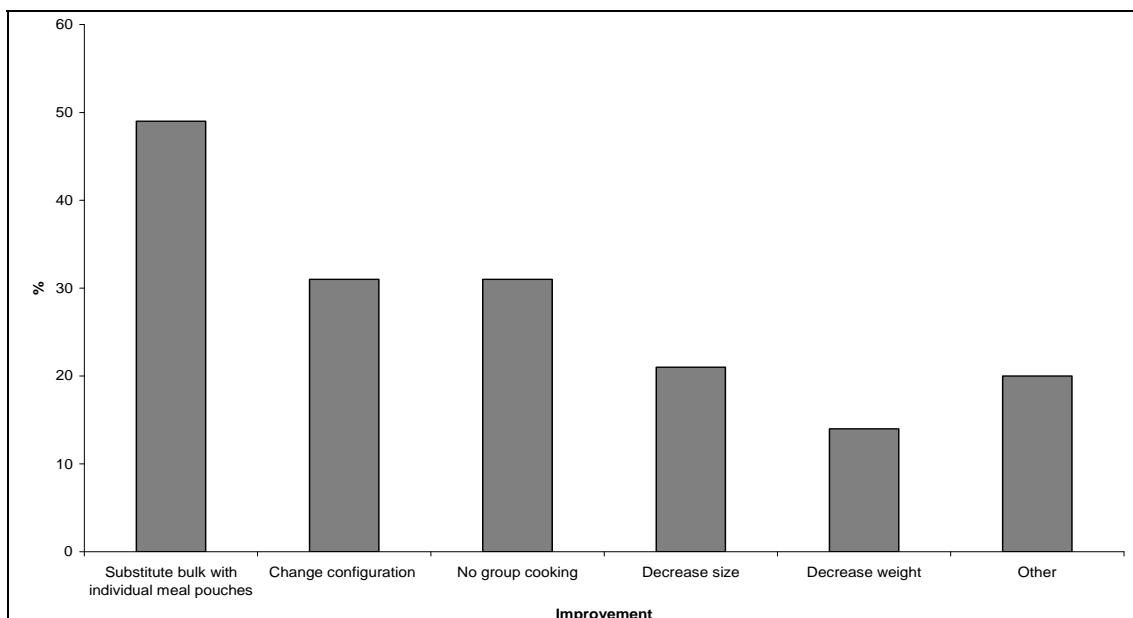


Figure 10: Levels of support for different ways in which the CR5M could be improved

3.3.4 Group Feeding Ration Configuration

No particular size was consistently identified as the optimum configuration of a group feeding ration pack. As displayed in Figure 11, support was given for the complete range of configuration options offered, ranging from 3 to 10. The most popular sizes were a three-, four- or five-person pack (total 74% of respondents) with these three options being approximately equally supported (see Figure 11). This indicates that a group feeder any larger than the current five-person configuration would not suit the majority of units using this type of pack.

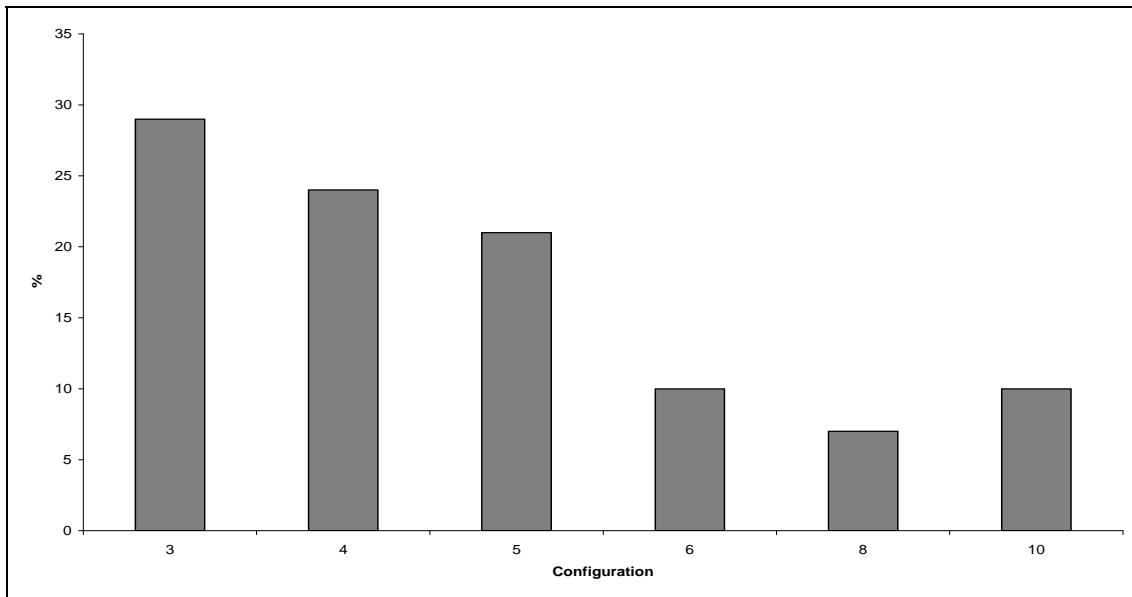


Figure 11: Relative levels of support for group feeder configurations that best suit unit needs

3.3.5 Packaging and Waste

Approximately 80% of respondents indicated that CR5M creates excessive waste, with packaging identified as the most important contributor. Table 4 displays the relative importance of potential causes of excessive waste in the CR5M.

Table 4: The relative importance of the potential causes of excessive waste in the CR5M, according to the user. The most common option(s) in each importance category is bolded.

	Most Important	Fairly Important	Least Important
Excessive packaging	54%	36%	9%
Food not liked	28%	52%	20%
Configuration	28%	43%	28%
Types of packaging	25%	60%	15%
Not enough time to prepare meals	20%	35%	44%
Too much food	8%	36%	57%

3.3.6 Alternative Methods for Field Feeding

With respect to possible alternative methods of field feeding, 60% agreed that a combination of CR1M and PR1M would be more suitable than a group feeding ration pack. A question as to whether there are situations in which CR1M/PR1M would not be a suitable replacement for CR5M was asked. Unfortunately, more than 50% of respondents failed to answer this question. Of the 22 responses, 64% of respondents indicated a belief that there are no occasions when the CR1M/PR1M combination would not be suitable. This is consistent with the finding that approximately 50% of respondents agreed that individual meal pouches should be provided in the CR5M. Figure 12 displays the support for alternative ration packs as a substitute for the CR5M.

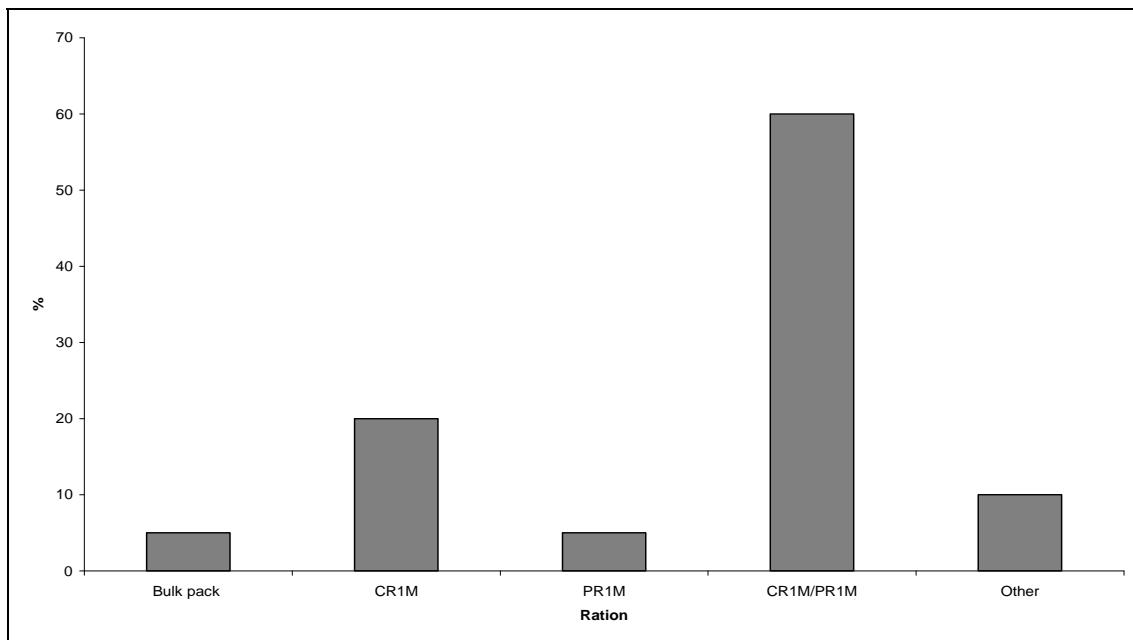


Figure 12: Relative level of support for alternative ration packs to the CR5M

Other strongly supported features of a group feeding pack included:

- Availability of bread (77% 'Strongly Agree')
- Main meal prepared by one person for the entire group (94% either 'Strongly Agree' or 'Agree')
- Not a lot of waste (92% either 'Strongly Agree' or 'Agree')
- Main meal can be eaten cold (87% either 'Strongly Agree' or 'Agree')

The level of importance attached to these properties correlated well with the level of agreement (i.e. respondents generally not only agreed with these suggestions, but also placed high importance on them).

3.4 Current use of the CR5M

The primary user of CR5M is 1st Brigade (1 BDE) which is the only Australian Army Armoured Brigade. As displayed in Figure 13, 1 BDE comprises of 7 units centrally controlled by Head Quarters (HQ) 1 BDE [13].

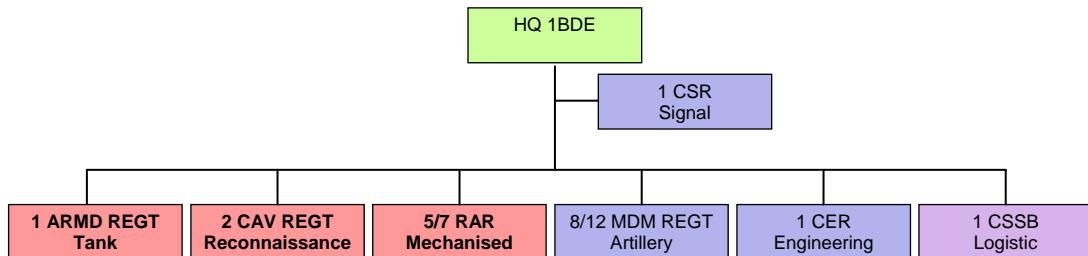


Figure 13: The structure of 1st Brigade (■ Headquarters 1st Brigade, ■ Combat regiments, ■ Combat support regiments and ■ Combat service support regiments)[13].

Small groups containing 2 to 12 members in a vehicle or team typically make up the units of 1 BDE. Depending on the conditions of deployment and/or field training exercise, 1 BDE use approximately 13400 packs of CR5M and 15700 packs of CR1M per year. As outlined in Table 5, 1 ARMD REGT has the highest average usage of CR5M (3553 packs/year) of the 1 BDE units. The second and third largest users of the CR5M are 2 CAV REGT (807 packs/year) and 8/12 MDM REGT (794 packs/year), respectively. Both of these units have also used significant amounts of CR1M, with 8/12 MDM REGT using more than twice as many CR1M as CR5M. From the 06/07 financial year HQ 1 BDE began to centrally control and resource CRPs for specific exercises involving all 1 BDE units. As a result, HQ 1 BDE's use of CR5M has increased to facilitate these exercises (LTCOL A.G. Huss, HQ 1 BDE, personal communication, 10 September 2009).

1 BDE has used 15% more CR1M than CR5M packs with an average of 15,700 CR1M packs used per year (CAPT G.A. Chambers, HQ 1BDE, personal communication, 17 August 2009). The preference for CR1M rations by 1 BDE units is likely to lead to a surplus in CR5M packs and their subsequent disposal due to the expiration of food components.

Table 5: *Ration Usage by 1 BDE[#]*

User	Ration Type	Usage per Financial Year (packs)			Total Usage (packs)	Average Usage per Year (packs)
		05/06	06/07	07/08		
1 ARMD REGT	CR5M	5140	1335	4185	10660	3553
	CR1M	543	47	145	735	245
2 CAV REGT	CR5M	455	741	1225	2421	807
	CR1M	860	595	727	2182	727
5/7 RAR	CR5M	360	381	108	849	283
	CR1M	1220	2678	4940	8838	2946
8/12 MDM REGT	CR5M	1022	930	429	2381	794
	CR1M	3246	1334	1630	6210	2070
1 CER	CR5M	0	260	0	260	87
	CR1M	5110	0	2480	7590	2530
1 CSR	CR5M	43	5	0	48	16
	CR1M	1742	1179	1661	4582	1527
1 CSSB	CR5M	0	0	0	0	0
	CR1M	5118	770	1653	7541	2514
HQ 1 BDE	CR5M	0	13810	9780	23590	7863
	CR1M	1631	4142	3700	9473	3158

[#] Data sourced from HQ 1 BDE through personal communications with LTCOL Anthony Duus, CAPT Grant Chambers and Staff Officer (Science) Mr Kym Meaney, 17 Aug 2009.

3.5 Comparison of the CR5M with the CR1M: production costs and food components

3.5.1 Analysis of module cost factors

The cost of producing the CR5M was compared with the cost of producing the CR1M. The two main expenses used for this comparison were the cost of assembly and component costs. CRPs are assembled by a commercial company supplied by DMO with the components required for the range of CRPs⁴. The costs involved in assembly include the packaging materials, labour and administration. The components cost factor represents the actual procurement cost paid by DMO to acquire the components included in each type of CRP.

The average per module and per person/day cost factors for the financial year 2007 is outlined in Table 6. The average assembly cost per person/day shows that it is less expensive to assemble CR5M compared to CR1M. While the average total component cost per person/day is very similar for both CRPs at \$22.11 for CR5M and \$21.38 for CR1M.

⁴ In 2009, this arrangement changed with the signing of a contract between DMO and a prime contractor, NZ-based company Prepack Ltd. Under the contract, component procurement and ration pack assembly will be performed by Prepack Ltd. The cost analysis findings are expected to remain valid in terms of the relative costs for CR1M versus CR5M, although absolute dollar values may be different under the new arrangements.

Table 6: Comparison of the CR5M and CR1M Cost Factors for the financial year, 2007/2008[#]

Ration Type	Cost Factor	Average Cost Per Pack (\$)	Average Cost Per person per day (\$)
CR5M	Components	110.57	22.11
	Assembly	6.05	1.21
	Total [*]	116.62	23.32
CR1M	Components	21.38	21.38
	Assembly	4.40	4.40
	Total [*]	25.78	25.78

[#] Data sourced from the Combat Rations Information System – CRIS through personal communication with Liam Glennon, DMO, LSD, HLTHSPO, Medical/Dental Inventory Manager, 10 Dec 2008.

^{*} Other add-on costs (administrative, tendering and logistics) not included.

The average assembly cost represents only 5.2% and 17.1% of the total cost for CR5M and CR1M, respectively. Given the significantly lower assembly costs associated with CR5M, the total cost per person/day decreases by \$2.45 (9.5%) compared with the cost of producing the CR1M. Other add-on costs associated with administration, tendering and logistics, the data for which was not available for this study, may impact on the actual production cost of CRPs depending on variations in production quantities as a result of Army requirements and usage rates.

3.5.2 Comparison of the food components in CR5M and CR1M

The CR5M provides on average 15 MJ of energy per person per day, while the CR1M supplies on average 16–18 MJ of energy per person per day.

Most of the food components are identical, or at least similar, across the menus in both the CRPs, however, the individual portion sizes may differ slightly. For example, the main meals Beef Mince with Spaghetti, Lamb and Rosemary, and Chicken Curry vary from 200 g per serve in the CR5M to 250 g per serve in the CR1M. Two varieties of the Fruit Spread are provided in the CR5M with 17 g per serve of each variety (a total of 34 g per person) while 26 g of a single variety of Fruit Spread is provided in the CR1M. Bulk packs of the main meals (2 x 500 g), Fruit Spread (2 x 85 g) and Vegetable Extract (1 x 85 g) are provided in the CR5M.

The CR5M has seven unique food components across the five menus, which are three varieties (fruit, chocolate and golden) of Pudding (1 x 350 g), Butter Concentrate (1 x 85 g), Rice (1 x 450 g), Sliced Potatoes (1 x 500 g), Sliced Carrot (1 x 250 g), Green Peas (1 x 250 g) and Sweet Corn (1 x 250 g).

The CR1M offers a greater variety of foods due to the eight menus available, compared with the five menus offered for the CR5M. Figure 14 displays a comparison of the main meal items contained in the CR5M and the CR1M; the main meals common to both packs are also identified. The menu sheets for the 2008/2009 procurement of the CR5M and CR1M are located at Appendices A.1 and A.4.

In addition to the extra menus, the CR1M also provides a greater number of easy-to-eat portion controlled snack items, such as the Muesli Bars and Biscuits. Muesli and Skim Milk Powder are now provided as specific breakfast items in four of the eight menu options. Tuna (1 x 85 g in three varieties) is another unique item supplied in three of the CR1M menus.

CR5M	CR1M
Beef, Mince, Savoury with Vegetable Beef & Pasta Beef & Blackbean	Beef, Mince with Spaghetti Lamb with Rosemary Chicken BBQ Chicken Curry Baked Beans

Figure 14: Comparison of main meal items contained in the 2008/2009 CR5M and CR1M menus

4. Discussion

4.1 Acceptability and consumption of food components

The results of the two acceptability surveys are very similar. One of the most pertinent outcomes from both surveys was that the general acceptability (liking or disliking) of a food item is not the only factor determining whether that food will be consumed. The results indicate, as has been found in other studies [14, 15], that consumption is influenced by a number of factors other than the simple liking or disliking of a food item. As described by Schultz [16], there are four factors which influence consumption: hunger, availability, hedonic characteristics (liking or disliking) and appropriateness. Appropriateness refers to the context in which food is eaten and may include the environment (temperature, conditions), location (barracks vs. field), attitude of consumer, meal occasion and social environments [16]. The results from the two acceptability surveys indicate that the appropriateness of ration items appears to have an important influence on their consumption.

Both acceptability surveys indicated that the main meals were generally found to be acceptable and consumption was high. The results also indicate that the consumption rates for these products are generally higher than for other food items with similar or higher acceptability. It is likely that the main meals are considered to have greater meal appropriateness for example a lunch and/or dinner meal occasion, compared to any of the other items. As a result the main meals are consumed in greater amounts regardless of their level of acceptability. The main meals may also be considered to provide greater satiation⁵

⁵ Fully satisfied

than other ration components particularly due to the presence of meat (protein) as a main component. As such they are consumed in preference to other items which may have higher acceptability ratings. This is consistent with the findings from a number of studies which have found that foods with higher levels of protein, fibre and water are associated with increased feelings of satiation [17, 18].

Both surveys highlighted a large number of food items with poor acceptability and consumption rates. This is of concern considering the contribution made by these components to the total nutritional value of the CR5M. Due to the high level of under-consumption of CRP that has been indicated in previous DSTO studies [19, 20], it is imperative that the poorly performing food components in the CR5M are replaced with more acceptable alternatives.

The Soup Powders were rated low for acceptability and poorly consumed. Depending on the flavour, the Soup Powders are major contributors of folate (chicken, beef, savoury vegetable and tomato) and thiamin (beef and chicken noodle). The Fruit Pudding, a major contributor of vitamin E [21], was also found to be poorly consumed despite moderate-to-good acceptability.

Reformulation of the Soup varieties may increase acceptability. The appropriateness of Soup as a component in CRP may hamper any attempts to increase the consumption of this item via increased general acceptability, particularly when the operational environment is considered. The effort and time to prepare and consume the soup may also be an important determinant in its consumption; both of these factors have been shown to impact consumption in military scenarios [22, 23]. An increase in effort and limited time is associated with poorer consumption, while a decrease in effort and more time have been associated with greater consumption [23-25]. The amount of available time was shown to have the greatest influence on the consumption of ration pack food items in a DSTO field study conducted in 2007 [24]. A more appropriate alternative to the Soup Powders may need to be considered.

Both the Beverage Base Powders and Sports Beverage Powders (reformulated item in the 2000/2001 procurement of the CR5M) were the least acceptable and least consumed drinks in both surveys. The reformulation of the Beverage Base Powders has not improved the acceptability or the consumption of this item. The Beverage Base Powders and the Sports Beverage Powders are major contributors of vitamin C to the CR5M and, if excluded, the vitamin C content of the CR5M would be reduced to marginally adequate levels [21, 26].

Acceptability was a poor predictor of consumption for the Hot Beverages and may be related again to the appropriateness of these items to the operational environment. The time and effort involved in the preparation and consumption of hot beverages may also contribute to the low consumption of these items [22, 23, 25]. The higher rate of consumption of the Coffee may be due to habitual use and its perceived value as an aid for reducing the effects of fatigue.

Despite a moderate-to-good acceptability rating, Vegetable Extract was found to be poorly consumed in both surveys. This is another major contributor to the availability of important nutrients to the CR5M, particularly folate and riboflavin. If the Vegetable Extract was removed from the CR5M (or discarded by the end user) two of the five menus would fail to meet the Military Recommended Dietary Intake (MRDI) [27] for folate, and four of the five menus would fail for riboflavin [21].

The majority of respondents to both surveys indicated that they supplemented the CR5M with their own food ('Jack Rations'). The most popular Jack Rations were high carbohydrate foods (bread, noodles and pasta), the preferred energy source for working muscles and glycogen storage. If suitable and acceptable high carbohydrate foods were available in CRP it is likely that they would be consumed in the field and assist in the supply of sufficient carbohydrate for active ADF members. The identification and/or development of such foods should be a priority for the ADF.

As discussed above, the appropriateness of the Soup Powders, Hot Beverages, Vegetable Extract and Fruit Pudding as components of the CR5M may need to be considered. For these items it appears that both environment and meal appropriateness are major influences on their consumption. The effect of environmental appropriateness is further supported by results from the CBA survey when a comparison was made between units working in hot or cold climates. The results indicate that the current CR5M is more appropriate for use in cold environments compared with hot conditions. This is also supported by the majority of respondents to the same survey (56%) indicating that there is a need for a specific hot weather ration pack. The influence of meal appropriateness was also highlighted in the CBA survey in which 72% of respondents indicated that the CR5M lacks specific breakfast food items. The popularity of bread and muesli/oat and milk mixes (QCR5M and CBA surveys, respectively) as Jack Rations adds weight to this result. It is suggested that future studies should investigate the appropriateness, as well the general acceptability, of a ration item for a range of situations indicative of its proposed use to assist in predicting its consumption.

The surveys illustrate that the liking or disliking of food components in CRPs is important in determining consumption rates. This was clearly identified in the CBA survey where it was found that those respondents who provided an overall positive assessment of the CR5M generally ate more and a greater variety of the food items compared to those who provided an overall negative assessment.

4.2 User opinions on the CR5M

Results from the CBA survey indicated that there were a greater number of favourable responses for the CR5M compared to unfavourable responses. It is noted that there was great variability in the responses across the units involved in the study.

The most frequently requested change, as indicated in the CAS survey, is to substitute bulk meal pouches with individual meal pouches; this is of particular importance to respondents who currently consider the CR5M unsuitable. Another important request was for the removal of the need for group cooking. Both of these improvement requests would effectively convert the CR5M into five bulk-packed CR1Ms. In contrast, 48% of respondents to the CBA survey indicated a preference for bulk meal pouches.

The replacement of bulk meal pouches with individual portions would increase the waste associated with the group-feeding ration pack due to an increase in packaging. This conflicts with the concern of the majority of respondents, to the QCR5M and CAS surveys - that the CR5M creates excessive waste as a result of excessive packaging. Reducing the amount of waste created by the CR5M was a feature supported by 92% of respondents to the CAS

survey. Providing meals as individual portions would only add to the current perceived excessive waste created by the CR5M. Thus, the replacement of bulk meal pouches with individual portions may not improve the user acceptability and subsequent use of the CR5M.

A need for a change to the configuration of the CR5M was indicated by respondents to all of the surveys. No single configuration that best suits most users was identified. Results from the QCR5M survey indicates that the majority of users prepared and ate the CR5M in groups of three or four members, while the majority of respondents to the CBA survey indicated they prepared and ate the CR5M in pairs. Respondents to the CAS survey supported the complete range of configurations from three to ten. The majority of support was for the three, four or five configuration options, which were equally supported.

4.3 Use of the CR5M

Since the replacement of the CR10M by the CR5M many issues have arisen about its suitability as a group-feeding ration. Dissatisfaction with the CR5M as a group-feeder has led to a reduction in its use by units considered to be main users of this ration pack. Many units are opting to use the CR1M and PR1M ration packs instead of the CR5M. This is further highlighted by the use of CRP by the primary user of the CR5M, 1 BDE. The average yearly use of the CR1M was substantially greater (approximately 2000 packs) than the use of the CR5M for the financial years 05/06, 06/07 and 07/08. The use of the CR5M was also only 50% of the number of packs produced in one year. Thus, the limited use of the CR5M leads to a greater amount of waste associated with this ration pack.

Results from the CAS survey indicated that 94% of respondents had issued the CR5M to their units within the previous six months; the median use by respondents was only 200 CR5Ms in the previous six months. These figures further demonstrate how little the CR5M is being used by traditional users of the pack.

4.4 Are there alternatives to the CR5M?

The majority of respondents to the CAS survey agreed that a combination of CR1M and PR1M would be more suitable than a group feeding ration pack. This result is consistent with the finding that approximately 50% of respondents agreed that individual meal pouches should be provided in the CR5M.

Considering the results from all of the surveys, it may be appropriate to discontinue the CR5M. Rationing of units identified as users of the CR5M could be achieved with a combination of CR1M and PR1M with the provision of a cereal adjunct. The availability of bread was strongly supported with high importance by 77% of respondents to the CAS survey, and it was also the most common food used to supplement the CR5M by respondents to the QCR5M survey. Despite the greater energy value of the CR1M, providing bread as an adjunct to this pack is likely to maintain or increase the morale of the user.

Based on the results from the above studies the CR1M/PR1M combination continues to be an appropriate alternative. This form of rationing addresses the need for individual feeding indicated by respondents, due to the inclusion of individual meal portions and the greater

number of portion-controlled ready-to-eat foods. The CR1M also provides specific breakfast foods and a larger variety of foods due to its eight menus. If the CR1M was used instead of the CR5M the small additional cost of producing the CR1M would be negated by the greater acceptance and use of the packs compared to the current use of the CR5M. It is anticipated that the universal use of a CR1M/PR1M combination of rationing to all units would be more cost effective than the current system due to a reduction in wastage associated with the limited use of the CR5M. It would also be expected to reduce the cost associated with administration, tendering and logistics.

4.5 Future research

There are a number of food components that are repeatedly poorly rated for acceptability and/or have low consumption rates. Further investigation is warranted into appropriate alternatives that are of similar nutritional value but have greater acceptability and consumption rates. The foods commonly used for Jack Rations as identified in the above studies should also be investigated for inclusion in CRPs. When determining the value of a prospective ration component, the consumption rates and other influences, such as behavioural and environmental factors, in addition to acceptability (general liking or disliking of a food) should be investigated.

Under VCDF Task 07/82, DSTO-Scottsdale is planning to investigate supply chain logistics management for CRPs and the nutritional requirements of military personnel engaged in various operational scenarios. The results from this work will provide valuable information that will assist in the design of future ration packs and rationing systems. It is expected that significant changes to the current suite of rations may be recommended as a result of this research. In the interim, it is recommended that the CR1M/PR1M combination be used as a universal means of rationing, until the results of the above research become available.

5. Conclusions

1. Current usage rates (by units), consumption levels (by individual ADF members) and the opinions expressed by respondents in all surveys indicate that the CR5M is not fully meeting the perceived needs of the ADF.
2. There is support for the view that the CR1M and PR1M could easily substitute for the CR5M, and that the use of individual 24-hour packs with the provision for a cereal adjunct would be appropriate in all operational circumstances.
3. A group feeder providing greater than five rations per pack has little support from ADF units or individual members.
4. If a group feeder is to be used, a three-, four- or five-person ration would be acceptable to the majority of units.
5. Concerns that there is excessive packaging of the CR5M is a problem that should be addressed if the pack is to be retained in service.
6. Generally the main meals of the CR5M were found to be acceptable and were mostly consumed in their entirety.
7. Although heating of main meals was found to be important, it was recognised that this is not always possible. Consequently, all main meals in Australian CRPs should be at least reasonably palatable when eaten cold.
8. The least acceptable and least consumed items identified by the respondents of both acceptability surveys were Lamb and Rosemary, Baked Beans, all of the Soups, Anzac Muesli Bar, all of the Beverage Powders, Butter Concentrate and the Vegetable Extract.
9. The food items used by ADF members for Jack Rations should be further investigated for inclusion in CRP.
10. The majority of respondents to the CAS survey indicated a need for a hot weather ration pack, providing support for the current investigation by DSTO-Scottsdale into the design and development of a prototype hot weather ration pack.
11. When determining the value of a combat ration pack it is important to investigate consumption levels and other influences, such as behavioural and environmental factors, in addition to acceptability—some foods (e.g. coffee in the CR5M) have high consumption rates despite low acceptability, while others (e.g. fruit spreads) may rate highly for acceptability but have low consumption rates.
12. The universal use of a CR1M/PR1M combination of rationing to all units is expected to be a cost effective alternative to the CR5M due to a reduction in the waste associated with the limited use of the CR5M and a reduction in the cost of managing the rationing system.

6. Recommendations

1. It is recommended that the CR5M be discontinued and field feeding be achieved by a combination of 24-hour packs and fresh feeding. This would be subject to review when the results of other activities under VCDF Task 07/082 become available in the next 3-5 years.
2. If production of a small group-feeding ration is to continue, it is recommended that:
 - a. A three- or four- person configuration be considered.
 - b. The type and form of packaging be investigated to reduce the problem of excessive waste.
 - c. All main meals be edible with or without heating.
 - d. The least acceptable items in the current CR5M—in particular Lamb and Rosemary, Baked Beans, Soups and Sports Drinks—be reformulated to improve acceptability and consumption levels.
 - e. Investigation be conducted into identifying and/or developing foods for inclusion in a group-feeder and the substitution of unacceptable foods with foods of similar nutritional value but higher acceptability and consumption rates.
 - f. A recognisable 'breakfast' food, such as those used in the CR1M, be included.
 - g. Whenever possible, bread should be supplied as an adjunct to a group-feeding ration.
3. All influences on food consumption, of which hedonic characteristics is just one, should be investigated when considering the value of food items to CRPs during design activities or when identifying replacement components.
4. Consideration should be given to the further development and use of the prototype 'hot weather' ration pack.

7. Acknowledgments

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8. References

1. Australian Defence Force Ration Scales Committee (2000) *The 91st Australian Defence Force Ration Scales Committee Meeting*. Scottsdale, Tasmania. Headquarters Support Command Australia, Victoria Barracks, Melbourne, Australia.
2. Australian Defence Force Ration Scales Committee (2004) *Australian Defence Force Ration Scales Committee Meeting*. Scottsdale, Tasmania.
3. Australian Defence Force Ration Scales Committee (2005) *Australian Defence Force Ration Scales Committee Meeting*. Scottsdale, Tasmania.
4. IJ Ford (25th June 2002) *Minute from Joint Logistics to Land Headquarters: Critique of CR5M - I Div response*. Department of Defence.
5. A Stow (3rd July 2001) *Dot Brief for J1/4 on 5 Man CRP*. Department of Defence.
6. Department of Defence (2008) *Australian Defence Force Food Specifications and Scales of Issue: SUPMAN 4*. Department of Defence, Editor. Canberra. Commonwealth of Australia.
7. Australian Defence Force Ration Scales Committee (1997) *The 88th Australian Defence Force Ration Scales Committee Meeting*. Department of Defence, Editor. Scottsdale, Tasmania.
8. GE Driver (1993) *The Re-design of Australian Combat Ration Packs: Possible Improvements for the Combat Ration Ten Man (CR10M): Report to DGFD (L)*. Defence Science and Technology Organisation,
9. C de Graaf, de Jong, L and Lambers, A (1999) Palatability affects satiation but not satiety. *Physiology and Behaviour* **66** 681-88
10. U Helleman and Tuorila, H (1991) Pleasantness rating and consumption of open sandwiches with varying NaCl and citric acid contents. *Appetite* **17** 229-38
11. A Drewnowski (1997) Taste preferences and food intake. *Annual Review of Nutrition* **17** (237-53)
12. EH Zandstra, et al. (1999) Laboratory hedonic rating as predictor of consumption: Three brief-exposure tests compared to an ad libitum consumption test. *Food Quality and Preference* **10** 411-18
13. Department of Defence. *Forces Command, HQ 1 BDE, HQ 1 BDE home*. [internet](2009) Updated 16 September, 2009 [Accessed 2009, 24 September].
14. HG Schultz (1988) Beyond preference: Appropriateness as a measure of contextual acceptance of food. In: DMH Thomson (ed.) *Food Acceptability*. London, Elsevier Applied Science 115-34
15. R Sheperd, Schultz, HG and Sparks, P (1992) Prediction of frequency of food consumption from use, attitude and demographic variables. In: *Rose Marie Pangborn Memorial Symposium*, Jarvenpaa, Finland: 2-6th August
16. HG Schultz (1995) Eating situations, food appropriateness and consumption. In: BM Marriott (ed.) *Not Eating Enough: Overcoming Underconsumption of Military Operational Rations*. Washington, DC, National Academy Press 341-59

17. BJ Rolls, Hetherington, M and Burley, VJ (1988) The specificity of satiety: the influence of foods of different macronutrient content on the development of satiety. *Physiology and Behaviour* **43** (145-53)
18. SHA Holt, et al. (1995) A satiety index of common foods. *European Journal of Clinical Nutrition* **49** 675-90
19. CK Booth, et al. (2003) Effects of medium-term ration feeding during a ground defence training exercise in far north Queensland. *Military Medicine* **168** (1) 63-70
20. CK Booth, et al. (2001) *The effect of consumption of Australian combat rations on military personnel after a medium-term field exercise.*
21. BJ Skiller, McLaughlin, TN and Simpson, LE (2003) *Nutritional Analysis of the Australian Combat Ration Five Man, 2002/2003 Procurement.* DSTO-Scottsdale, Scottsdale, Tasmania.
22. E Hirsch, Kramer, FM and Meiselman, H.L (2005) Effects of food attributes and feeding environment on acceptance, consumption and body weight: lessons learned in a twenty-year program of military ration research: US Army Research (Part 2). *Appetite* **44** 33-45
23. E Hirsch, et al. (1984) *The Effects of Prolonged Feeding Meal, Ready-to-Eat (MRE) Operational Rations.* TR-85/035.
24. CJ Kullen, et al. (2009) *DSTO Technical Report: Field Evaluation of a Prototype Hot Weather Ration (in preparation).*
25. FM Kramer (1995) The physical eating situation. In: BM Marriott (ed.) *Not Eating Enough: Overcoming Underconsumption of Military Operational Rations.* Washington, DC, National Academy Press 319-39
26. TN McLaughlin (1999) *Laboratory Evaluation of the Australian Combat Ration Five Man.* Defence Science and Technology Organisation - Defence Food Science Centre, Scottsdale, Tasmania.
27. CH Forbes-Ewan (2009) *Australian Defence Force Nutritional Requirements in the 21st Century (Version 1).* Human Protection and Performance Division, Defence Science and Technology Organisation

Appendix A: Combat Ration Menus

A.1. The menu sheet for the 2008/2009 procurement of the CR5M

AUSTRALIAN DEFENCE FORCE									
COMBAT RATION (FIVE MAN)									
CONTENTS AND INSTRUCTION SHEET									
This Ration Pack is available in the five menus shown below. Occasionally, due to unavoidable circumstances, items may be substituted.									
A	B	C	D	E					
Beef, Mince, with Spag Lamb & Rosemary Baked Beans Beverage Powder, Sport - - Orange Biscuit - Shrewsbury Fruit, Diced, Two Fruits Fruit Spread - Raspberry Fruit Spread - Marmalade Pudding, Fruit Soup Powder, Chicken	2 x 500g 2 x 500g 2 x 500g 5 X 70g 5 x 47g 5 x 140g 1 x 85g 1 x 85g 1 x 350g 5 x 30g	Beef, Mince, Sav with Veg Chicken Curry Baked Beans Beverage Powder, Sport - - Tropical Biscuit - Krispies Fruit, Diced, Peaches Fruit Spread - Raspberry Fruit Spread - Blackcurrent Pudding, Chocolate	2 x 500g 2 x 500g 2 x 500g 5 X 70g 5 x 51g 5 x 140g 1 x 85g 1 x 85g 1 x 350g 5 x 30g	Beef & Pasta Chicken BBQ Baked Beans Beverage Powder, Sport - - Mixed Berry Biscuit - Krispies Fruit, Diced, Pears Fruit Spread - Blackcurrent Fruit Spread - Plum Pudding, Fruit	2 x 500g 2 x 500g 2 x 500g 5 X 70g 5 x 35g 5 x 140g 1 x 85g 1 x 85g 1 x 350g 5 x 30g	Beef & Blackbean Chicken BBQ Baked Beans Beverage Powder, Sport - - Raspberry Biscuit - Scotch Finger Fruit, Diced, Two Fruits Fruit Spread - Marmalade Fruit Spread - Raspberry Pudding, Golden	2 x 500g 2 x 500g 2 x 500g 5 X 70g 5 x 47g 5 x 140g 1 x 85g 1 x 85g 1 x 350g 5 x 30g	Chicken Curry Chicken BBQ Baked Beans Beverage Powder, Sport - - Tropical Biscuit - Shrewsbury Fruit, Diced, Peaches Fruit Spread - Marmalade Fruit Spread - Plum Pudding, Chocolate	2 x 500g 2 x 500g 2 x 500g 5 X 70g 5 x 35g 5 x 140g 1 x 85g 1 x 85g 1 x 350g 5 x 30g
Additional food items common to all CR5M menus				Non-food items common to all CR5M menus					
Bev, Chocolate, Pwdr Bev, Coffee, Instant Beverage, Tea Bags Sugar Milk, Con, Sweetened Butter Concentrate Cheese, Cheddar Chocolate Ration Confectionery Cream	5 x 40g 10 x 3.5g 10 x 2.5g 5 x 34g 5 x 85g 2 x 85g 5 x 56g 5 x 50g 5 x 85g	Salt Pepper, Black Curry Powder Sauce, Tomato Ketchup Sauce, Sweet Chilli Sauce, Soy Biscuit - Crispbread Vegetable Extract Chewing gum 4 pellet	5 x 2g 5 x 2g 5 x 3.5g 3 x 15g 3 x 10g 3 x 10g 5 x 34g 1 x 85g 5 x pkt	Rice Potatoes, Sliced Peas Green Carrots Sliced Corn, Sweet, Whole Kernel MB - Apricot & Coconut MB - Tropical Fruits MB - Forest Fruits Skittles	1 x 450g 1 x 500g 1 x 250g 1 x 250g 1 x 250g 5 x 32g 5 x 32g 5 x 32g 5 x ?	Can Opener Container, with lid Matches Pads, Scouring with Soap Rubber Bands Spoons, Dessert Toilet Paper, 10 Sheets Menu Sheet	2 only 4 only 2 x Box 2 only 3 only 5 only 5 x Pkt	Directions for Butter Concentrate To reconstitute the contents, first beat into a smooth paste, then add an amount of water or milk equivalent to one-sixth of the volume of butter and continue beating until the liquid is fully absorbed.	

A.2. The menu sheet for the 2000/2001 procurement of the CR5M

AUSTRALIAN DEFENCE FORCE									
COMBAT RATION (FIVE MAN)									
CONTENTS AND INSTRUCTION SHEET									
This Ration Pack is available in the five menus shown below. Occasionally, due to unavoidable circumstances, items may be substituted.									
A	B	C	D	E					
Beef, minced, with spaghetti	2 x 500g	Beef, minced, savoury, with veg	2 x 500g	Beef & Pasta	2 x 500g	Beef & Blackbean	2 x 500g	Baked Beans	2 x 500g
Beef satay	2 x 500g	Beef & vegetables, Dutch style	2 x 500g	Beef Stroganoff	2 x 500g	Beef Kai Si Ming	2 x 500g	Chicken, pasta & veg	2 x 500g
Frankfurters	2 x 185g	Chicken curry	2 x 500g	Sausages & spaghetti	2 x 500g	Spaghetti & meatballs	2 x 500g	Chicken satay	2 x 500g
Beverage powder, sport -		Beverage powder, sport -		Beverage powder, sport -		Beverage powder, sport -		Beverage powder, sport -	
- lemon & lime	5 X 12g	- raspberry	5 X 12g	- lemon & lime	5 X 12g	- orange	5 X 12g	- mixed berry	5 X 12g
- orange	5 X 12g	- tropical	5 X 12g	- mixed berry	5 X 12g	- raspberry	5 X 12g	- tropical	5 X 12g
Biscuit - Jam Sandwich	5 x 47g	Biscuit - Ginger Nut	5 x 51g	Biscuit - Shortbread	5 x 35g	Biscuit - Scotch Finger	5 x 35g	Biscuit - ANZAC	5 x 35g
Fruit, diced, two fruits	5 x 140g	Fruit, diced, peaches	5 x 140g	Fruit, diced, pears	5 x 140g	Fruit, diced, two fruits	5 x 140g	Fruit, diced, peaches	5 x 140g
Fruit spread - apricot	1 x 85g	Fruit spread - strawberry	1 x 85g	Fruit spread - apricot	1 x 85g	Fruit spread - raspberry	1 x 85g	Fruit spread - raspberry	1 x 85g
Fruit spread - blackcurrant	1 x 85g	Fruit spread - blackberry	1 x 85g	Fruit spread - blackcurrant	1 x 85g	Fruit spread - blackberry	1 x 85g	Fruit spread - strawberry	1 x 85g
Muesli bar -		Muesli bar -		Muesli bar -		Muesli bar -		Muesli bar -	
- ANZAC	5 x 32g	- forest fruit	5 x 32g	- forest fruit	5 x 32g	- tropical fruit	5 x 32g	- tropical fruit	5 x 32g
Peas, green	2 x 250g	Peas, green	2 x 250g					Peas, green	2 x 250g
Potatoes, sliced	1 x 500g	Potatoes, sliced	1 x 500g	Potatoes, sliced	1 x 500g			Potatoes, sliced	1 x 500g
				Rice	1 x 450g	Rice	2 x 450g		
Sauce, chilli, sweet	5 x 10g	Sauce, chilli, sweet	5 x 10g	Sauce, soy	5 x 10g	Sauce, soy	5 x 10g	Sauce, chilli, sweet	5 x 10g
Soup powder, chicken	5 x 30g	Soup powder, beef	5 x 30g	Soup powder, savoury veg	5 x 30g	Soup powder, chicken noodle	5 x 30g	Soup powder, tomato	5 x 30g
Additional food items common to all CR5M menus									
Beverage, chocolate, pwdr	5 x 40g	Chocolate ration	5 x 50g	Potatoes, sliced	1 x 500g	Can opener	2 only	Toilet paper, 10 Sheets	5 x Pkt
Beverage, coffee, instant	10 x 3.5g	Corn, sweet, whole kernel	1 x 250g	Pudding, fruit	1 x 350g	Container, with lid	4 only		
Beverage, tea, pot bag	10 x 2.5g	Curry powder	2 x 3.5g	Salt	5 x 2g	Lid, reclosure	1 only		
Biscuit - Crispbread	5 x 34g	MB - ANZAC	5 x 32g	Sauce, Tabasco	5 x 3g	Matches	2 x Box		
Butter concentrate	1 x 150g	- Apricot & Coconut	5 x 32g	Sauce, tomato ketchup	5 x 15g	Pads, scouring, soaped	2 only		
Carrots, sliced	1 x 250g	Milk, condensed, sweetened	5 x 85g	Sugar	40 x 7g	Rubber bands	3 only		
Cheese, cheddar	5 x 56g	Pepper, black	5 x 2g	Vegetable extract	1 x 85g	Spoons, dessert	5 only		
Chewing gum 4 pellet	5 x pkt								
Non-food items common to all CR5M menus									

A.3. The menu sheet for the 1997/1998 procurement of the CR5M

AUSTRALIAN DEFENCE FORCE COMBAT RATION (FIVE MAN) CONTENTS AND INSTRUCTION SHEET					PACKED 1997/98			
A		B		C	D		E	
BREAKFAST		BREAKFAST		BREAKFAST		BREAKFAST		BREAKFAST
Beef Mince with Spaghetti 2 x 500 g pouch		Spaghetti, Tomato & Onion 2 x 500 g pouch		Spaghetti & Spaghetti 2 x 500 g pouch		Spaghetti & Meatballs 2 x 500 g pouch		Baked Beans 2 x 500 g pouch
Milk Condensed Sweetened 5 x 85 g tube		Milk Condensed Sweetened 5 x 85 g tube		Milk Condensed Sweetened 5 x 85 g tube		Milk Condensed Sweetened 5 x 85 g tube		Milk Condensed Sweetened 5 x 85 g tube
Vegetable Extract 1 x 85 g tube		Vegetable Extract 1 x 85 g tube		Vegetable Extract 1 x 85 g tube		Vegetable Extract 1 x 85 g tube		Vegetable Extract 1 x 85 g tube
Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt
Coffee, Soluble 5 x 3.5 g pkt		Coffee, Soluble 5 x 3.5 g pkt		Coffee, Soluble 5 x 3.5 g pkt		Coffee, Soluble 5 x 3.5 g pkt		Coffee, Soluble 5 x 3.5 g pkt
Chocolate Drinking Powder 5 x 20 g pkt		Chocolate Drinking Powder 5 x 20 g pkt		Chocolate Drinking Powder 5 x 20 g pkt		Chocolate Drinking Powder 5 x 20 g pkt		Chocolate Drinking Powder 5 x 20 g pkt
Pepper 5 x 2 g pkt		Pepper 5 x 2 g pkt		Pepper 5 x 2 g pkt		Pepper 5 x 2 g pkt		Pepper 5 x 2 g pkt
Muesli Bar –		Muesli Bar –		Muesli Bar –		Muesli Bar –		Muesli Bar –
These Fruits 5 x 32 g		Frozen Fruits 5 x 32 g		Apricot and Coconut 5 x 32 g		Tropical Fruits 5 x 32 g		Tropical Fruits 5 x 32 g
Apricot and Coconut 5 x 32 g		Apricot and Coconut 5 x 32 g		Tropical Fruits 5 x 32 g		Frozen Fruits 5 x 32 g		Frozen Fruits 5 x 32 g
Biscuit Crispbread 5 x 30 g		Biscuit Crispbread 5 x 30 g		Biscuit Crispbread 5 x 30 g		Biscuit Crispbread 5 x 30 g		Biscuit Crispbread 5 x 30 g
LUNCH								
BREAKFAST		BREAKFAST		BREAKFAST		BREAKFAST		BREAKFAST
Beef/Noodle Soup Powder 1 x 50 g		French Onion Soup Powder 1 x 50 g		Chicken Noodle Soup Powder 1 x 50 g		Chicken Noodle Soup Powder 1 x 50 g		Chicken Noodle Soup Powder 1 x 50 g
Pea & Ham Soup Powder 1 x 50 g		Pea & Ham Soup Powder 1 x 50 g		Beef/Noodle Soup Powder 1 x 50 g		Beef/Noodle Soup Powder 1 x 50 g		Tomato Soup Powder 1 x 50 g
Frankfurters 2 x 500 g pouch		Lamb and Rosemary 2 x 500 g pouch		Beef & Pasta 2 x 500 g pouch		Beef Kui Si Ming 2 x 500 g pouch		Chicken, Pasta & Vegetables 2 x 500 g pouch
Potatoes 1 x 450 g can		Potatoes 1 x 450 g can		Pasta Slices 1 x 500 g pouch		Pasta Slices 1 x 500 g pouch		Potatoes 1 x 450 g can
Pasta, Green 1 x 500 g pouch		Pasta, Green 1 x 500 g pouch		Rice 1 x 500 g pouch		Rice 1 x 500 g pouch		Pasta, Green 1 x 500 g pouch
Tomato Sauce 1 x 225 g can		Tomato Sauce 1 x 225 g can		Tomato Sauce 1 x 225 g can		Tomato Sauce 1 x 225 g can		Tomato Sauce 1 x 225 g can
Sugar 10 x 7 g pkt		Sugar 10 x 7 g pkt		Sugar 10 x 7 g pkt		Sugar 10 x 7 g pkt		Sugar 10 x 7 g pkt
Tea 10 x 2 g pkt		Tea 10 x 2 g pkt		Tea 10 x 2 g pkt		Tea 10 x 2 g pkt		Tea 10 x 2 g pkt
Salt 5 x 2 g pkt		Salt 5 x 2 g pkt		Salt 5 x 2 g pkt		Salt 5 x 2 g pkt		Salt 5 x 2 g pkt
Mustard 3 x 3.5 g pkt		Mustard 3 x 3.5 g pkt		Mustard 3 x 3.5 g pkt		Mustard 3 x 3.5 g pkt		Mustard 3 x 3.5 g pkt
Bev Haze Powder –		Bev Haze Powder –		Bev Haze Powder –		Bev Haze Powder –		Bev Haze Powder –
Orange 5 x 12 g pkt		Orange 5 x 12 g pkt		Orange 5 x 12 g pkt		Orange 5 x 12 g pkt		Orange 5 x 12 g pkt
Lime 5 x 12 g pkt		Lime 5 x 12 g pkt		Lime 5 x 12 g pkt		Lime 5 x 12 g pkt		Lime 5 x 12 g pkt
Lemon 5 x 12 g pkt		Lemon 5 x 12 g pkt		Tropical 5 x 12 g pkt		Tropical 5 x 12 g pkt		Tropical 5 x 12 g pkt
Biscuit Shortbread 5 x 35 g pkt		Biscuit Shortbread 5 x 35 g pkt		Biscuit Shortbread 5 x 35 g pkt		Biscuit Shortbread 5 x 35 g pkt		Biscuit Shortbread 5 x 35 g pkt
Chocolate Ration 5 x 50 g pkt		Chocolate Ration 5 x 50 g pkt		Chocolate Ration 5 x 50 g pkt		Chocolate Ration 5 x 50 g pkt		Chocolate Ration 5 x 50 g pkt
DINNER								
BREAKFAST		DINNER		DINNER		DINNER		DINNER
Beef & Gravy 2 x 500 g		Beef and Vegetables 2 x 500 g		Beef Stroganoff 2 x 500 g		Beef & Macaroni 2 x 500 g		Salmon & Pasta Mixture 2 x 500 g
Potatoes 1 x 450 g can		Potatoes 1 x 450 g can		Potatoes 1 x 500 g pouch		Rice 1 x 500 g pouch		Potatoes 1 x 450 g can
Carrots 1 x 250 g pouch		Carrots 1 x 250 g pouch		Carrots 1 x 250 g pouch		Carrots 1 x 250 g pouch		Carrots 1 x 250 g pouch
Corn Sweet 1 x 250 g pouch		Corn Sweet 1 x 250 g pouch		Corn Sweet 1 x 250 g pouch		Corn Sweet 1 x 250 g pouch		Corn Sweet 1 x 250 g pouch
Cheese Canned 5 x 56 g can		Cheese Canned 5 x 56 g can		Cheese Canned 5 x 56 g can		Cheese Canned 5 x 56 g can		Cheese Canned 5 x 56 g can
Two Fruits, dried 5 x 140 g can		Peaches, dried 5 x 140 g can		Fruit Pudding 2 x 340 g can		Fruit Pudding 2 x 340 g can		Fruit Pudding 2 x 340 g can
Jam Apricot 1 x 85 g tube		Jam Strawberry 1 x 85 g tube		Jam Apricot 1 x 85 g tube		Jam Raspberry 1 x 85 g tube		Jam Raspberry 1 x 85 g tube
Jam Blackcurrant 1 x 85 g tube		Jam Blackberry 1 x 85 g tube		Jam Blackcurrant 1 x 85 g tube		Jam Blackberry 1 x 85 g tube		Jam Strawberry 1 x 85 g tube
Curry Powder 1 x 14 g pkt		Curry Powder 1 x 14 g pkt		Curry Powder 1 x 14 g pkt		Curry Powder 1 x 14 g pkt		Curry Powder 1 x 14 g pkt
Coffee, Soluble 10 x 3.5 g pkt		Coffee, Soluble 10 x 3.5 g pkt		Coffee, Soluble 10 x 3.5 g pkt		Coffee, Soluble 10 x 3.5 g pkt		Coffee, Soluble 10 x 3.5 g pkt
Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt		Sugar 20 x 7 g pkt
Butter Concentrate 1 x 150 g pkt		Butter Concentrate 1 x 150 g pkt		Butter Concentrate 1 x 150 g pkt		Butter Concentrate 1 x 150 g pkt		Butter Concentrate 1 x 150 g pkt
Chewing Gum 4 Pkt 5 x pkt		Chewing Gum 4 Pkt 5 x pkt		Chewing Gum 4 Pkt 5 x pkt		Chewing Gum 4 Pkt 5 x pkt		Chewing Gum 4 Pkt 5 x pkt
Soya Sauce 5 x 10 g		Soya Sauce 5 x 10 g		Soya Sauce 5 x 10 g		Soya Sauce 5 x 10 g		Soya Sauce 5 x 10 g
Tabasco Sauce 5 x 3 g		Tabasco Sauce 5 x 3 g		Tabasco Sauce 5 x 3 g		Tabasco Sauce 5 x 3 g		Tabasco Sauce 5 x 3 g
Chilli Sauce 5 x 10 g		Chilli Sauce 5 x 10 g		Chilli Sauce 5 x 10 g		Chilli Sauce 5 x 10 g		Chilli Sauce 5 x 10 g
SUNDRIES								
Matches 2 x Box		Toilet Paper 5 x 10 sheets		Scouring Pads with soap 5 x Nos		Rubberbands Size 32 3 x Nos		
Can openers 5 x Nos		Container Plastic 4 x Nos		Spoons, dessert, Plastic 5 x Nos				
Fibreboard carton 1 x Nos		Fibreboard Inners 2 x Nos		Lids, plastic, disposable 1 x Nos				

This ration pack is available in five menus - A, B, C, D & E.

The contents of each menu differ to the extent shown above.

NB This pack is complete and no supplement is required.

A.4. The menu sheet for the 2008/2009 procurement of the CR1M

AUSTRALIAN DEFENCE FORCE – COMBAT RATIONS ONE MAN							
CONTENTS SHEET							
The Combat Ration One Man is available in the eight menus shown below. Due to unavoidable circumstances, items may be substituted. Nutritional and Shelf Life information is available from Catering Fleet Technical Advisors. All suggestions / comments: Email crp.feedback@defence.gov.au							
MENU A		MENU B		MENU C		MENU D	
Braised Beef and Gravy	1x250g	Beef Teriyaki	1x250g	Chicken Curry	1x250g	Beef BBQ	1x250g
Chicken, BBQ	1x250g	Salmon & Pasta Mornay	1x250g	Sausages & Vegetables	1x250g	Chicken Italiano	1x250g
Soup, Savoury	1x30g	Soup, Beef	1x30g	Bev Powder, Type II, Tropical	1x70g	Soup, Chicken	1x30g
Bev Powder, Type II, Tropical	1x70g	Bev Powder, Type II, Grape	1x70g	Biscuit, Shrewsbury	1x45g	Bev Powder, Type II, Tropical	1x70g
Biscuit, Crispbread	1x35g	Biscuit, Shrewsbury	1x45g	Biscuit, Vitalife Wellgrain	1x36g	Biscuit, Crispbread	1x34g
Biscuit, Krispie	1x33g	Biscuit, Vitalife Wellgrain	1x36g	Confectionary Spread – Vanilla	1x50g	Biscuit, Krispie	1x43g
Confectionary Spread – Choc	1x50g	Freeze Dried Rice	1x55g	Fruit Grains, Mix Berry	1x15g	Confectionary Spread – Vanilla	1x50g
Curry Powder	1x3.5g	Fruit Grains, Blackcurrant	1x15g	Fruit Spread, Raspberry	1x26g	Fruit Grains, Raspberry	1x15g
Fruit Grains, Apricot	1x15g	Fruit Spread, Marmalade	1x32g	Fruit, Pears, Diced	1x140g	Fruit Spread, Plum	1x26g
Fruit Spread, Blackcurrant	1x26g	Fruit, Peaches, Diced	1x140g	MB, Apricot & Coconut	1x32g	Fruit, Two Fruits, Diced	1x140g
Fruit, Peaches, Diced	1x140g	MB, Apricot & Coconut	1x32g	Muesli Cereal, Natural	1x60g	MB, Tropical Fruits	1x32g
MB, Tropical Fruits	1x32g	MB, Tropical Fruits	1x32g	Milk, Dried Skim	1x3g	MB, Apricot & Coconut	1x32g
Muesli Cereal, Fruitful	1x60g	MB, Forest Fruits	1x32g	Noodles Beef Flavour	1x47g	MB, Forest Fruits	1x32g
Milk, Dried Skim	1x3g	Noodles Chicken Flavour	1x47g	Sauce, BBQ	1x10g	Sauce, BBQ	1x10g
Sauce, Tomato	1x15g	Sauce, Sweet Chilli	1x10g	Sauce, Tomato	1x15g	Sauce, Tomato	1x15g
Sauce, Sweet Chilli	1x10g	Sauce, Tomato	1x15g			Sauce, Worcestershire	1x10g
Tuna in Springwater	1x85g					Tuna with Dried Tomato	1x85g

Packed 2008/2009

MENU E		MENU F		MENU G		MENU H	
Beef Mince w/ Tortellini	1x250g	Meatballs, Beef with Sweet and Sour Sauce	1x250g	Chilli Con Carne	1x250g	Baked Beans	1x250g
Lamb with Rosemary	1x250g	Sausages & Vegetables Curry	1x250g	Beef Mince with Spaghetti	1x250g	Vegetable Curry	1x250g
Soup, Tomato	1x30g	Soup, Tomato	1x30g	Soup, Beef	1x30g	Soup, Savoury	1x30g
Bev Powder, Type II, Tropical	1x70g	Bev Powder, Type II, Mixed Berry	1x70g	Bev Powder, Type II, Orange	1x70g	Bev Powder, Type II, Mixed Berry	1x70g
Biscuit, Crispbread	1x34g	Biscuit, Scotch Finger	2x35g	Biscuit, Scotch Finger	1x35g	Biscuit, Shrewsbury	1x47g
Biscuit, Krispie	1x43g	Biscuit, Vitalife Wellgrain	1x36g	Biscuit, Vitalife Wellgrain	1x36g	Biscuit, Crispbread	1x34g
Confectionary Spread – Vanilla	1x50g	Confectionary Spread – Chocolate	1x50g	Fruit Grains, Blackcurrant	1x15g	Confectionary Spread – Vanilla	1x50g
Fruit Grains, Strawberry	1x15g	Fruit Grains, Apricot	1x15g	Fruit Spread, Raspberry	1x26g	Fruit Grains, Apricot	1x15g
Fruit Spread, Blackcurrant	1x26g	Fruit Spread, Plum	1x26g	Fruit, Pears, Diced	1x140g	Fruit Spread, Marmalade	1x32g
Fruit, Two Fruits, Diced	1x140g	Fruit, Two Fruits, Diced	1x140g	MB, Tropical Fruits	1x32g	Fruit, Peaches, Diced	1x140g
MB, Forest Fruits	1x32g	MB, Forest Fruits	1x32g	MB, Forest Fruits	1x32g	MB, Tropical Fruits	1x32g
Muesli Cereal, Fruitful	1x60g	Noodles, Beef Flavour	1x47g	MB, Apricot & Coconut	1x32g	MB, Forest Fruits	1x32g
Milk, Dried Skim	1x3g	Muesli Cereal, Natural	1x60g	Sauce, Worcestershire	1x10g	MB, Apricot & Coconut	1x32g
Noodles, Chicken Flavour	1x47g	Milk, Dried Skim	1x3g	Sauce, Tomato	1x15g	Sauce, Sweet Chilli	1x10g
Curry Powder	1x3.5g	Sauce, BBQ	1x10g			Sauce, Tomato	1x15g
Sauce, Sweet Chilli	1x10g	Sauce, Sweet Chilli	1x10g			Tuna with Dried Tomato	1x85g
Sauce, Tomato	1x15g						

ADDITIONAL ITEMS COMMON TO ALL MENUS

Bev, Chocolate Powder	1x30g	Milk, Sweet Condensed	1x85g	Salt	1x2g	Matches, Safety, Vial	1
Bev, Coffee Instant	2x3.5g	Cheese Cheddar Canned	1x56g	Bag, Plastic, Resealable	1	Pads Scouring, Nylon	1
Bev, Tea Bags	2x2.5g	Chocolate Ration	1x50g	Bag, Plastic, Inner	1	Spoon Plastic	1
Sugar	8x7g	Vegetable Extract	1x15g	Rubber Bands, Size 32	2	Toilet Paper, Sheets	10
Candy Chocolate (M&M's)	1x55g	Chewing Gum,	2 pkts	Rubber Band, Size 61	1	Menu Sheet	1
Candy Hard Various	2x30g	Pepper, Black	1x2g	Can Opener Hand	1	Ingredient Sheet	1

Appendix B: Questionnaires

B.1. Questionnaire for the 1997/1998 procurement of the CR5M

QUESTIONNAIRE FOR COMBAT RATION FIVE MAN (CR5M)

To improve the acceptability of the CR5M we need to find out what you think about it. As a frequent user of Ration packs, you are in the best position to advise us on any changes needed to improve this pack, so please don't hesitate to give your unbiased opinion of each item. Your answers will assist us in improving the ration pack for you. **Your answers will be confidential.**

DATE: _____

UNIT: _____ SUB UNIT: _____ SECTION: _____

YEARS IN ADF: _____ AGE: _____

SEX: Male / Female

HEIGHT: _____ WEIGHT: _____

NAME: (Optional) _____

- 1). Select the appropriate menu (For example: complete the questionnaire for Menu C if you ate CR5M Menu C).

Menu A

Please circle the appropriate place for each item.

Item	Amount of Item Eaten					Preparation	Amount Provided	
	None	Some	All	More than one box				
Eg: Fish n' Chips	0	25	50	75	100	100+	Hot/Cold	1. Not Enough 2. Just Right 3. Too much
Beef & Gravy	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beef Minced with Spaghetti	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beef Noodle Soup Powder	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beverage powder - Orange	0	25	50	75	100	100+		1 2 3
Beverage Powder - Lemon	0	25	50	75	100	100+		1 2 3
Beverage Powder - Lime	0	25	50	75	100	100+		1 2 3
Shortbread Biscuit	0	25	50	75	100	100+		1 2 3
Carrots	0	25	50	75	100	100+	Hot/Cold	1 2 3
Corn, Sweet	0	25	50	75	100	100+	Hot/Cold	1 2 3
Frankfurters	0	25	50	75	100	100+	Hot/Cold	1 2 3
Fruit Pudding	0	25	50	75	100	100+	Hot/Cold	1 2 3
Apricot Jam	0	25	50	75	100	100+		1 2 3
Blackcurrant Jam	0	25	50	75	100	100+		1 2 3
Muesli Bar, Apricot & C'nut	0	25	50	75	100	100+		1 2 3
Muesli Bar, Three fruits	0	25	50	75	100	100+		1 2 3
Soup Powder, Pea & Ham	0	25	50	75	100	100+	Hot/Cold	1 2 3
Peas, Green	0	25	50	75	100	100+	Hot/Cold	1 2 3
Potatoes	0	25	50	75	100	100+	Hot/Cold	1 2 3

[Go to Question 2.](#)

Menu B

Please circle and write comments in the appropriate place for each item.

Item	Amount of Item Eaten					Preparation	Amount Provided		
	None	Some	All	More than one issue			1. Not Enough	2. Just Right	3. Too much
Eg: Fish n' Chips	0	25	50	75	100	100+	Hot/Cold	1	(2)
Beef & Vegetables	0	25	50	75	100	100+	Hot/Cold	1	2
Beverage Powder – Lemon	0	25	50	75	100	100+	Hot/Cold	1	2
Beverage powder – Orange	0	25	50	75	100	100+	Hot/Cold	1	2
Beverage powder – Tropical	0	25	50	75	100	100+	Hot/Cold	1	2
Shortbread Biscuit	0	25	50	75	100	100+	Hot/Cold	1	2
Carrots	0	25	50	75	100	100+	Hot/Cold	1	2
Corn, Sweet	0	25	50	75	100	100+	Hot/Cold	1	2
Soup Powder, French Onion	0	25	50	75	100	100+	Hot/Cold	1	2
Fruit Pudding	0	25	50	75	100	100+	Hot/Cold	1	2
Blackberry Jam	0	25	50	75	100	100+	Hot/Cold	1	2
Strawberry Jam	0	25	50	75	100	100+	Hot/Cold	1	2
Lamb and Rosemary	0	25	50	75	100	100+	Hot/Cold	1	2
Muesli Bar, Apricot & C'nut	0	25	50	75	100	100+	Hot/Cold	1	2
Muesli Bar, Forest fruit	0	25	50	75	100	100+	Hot/Cold	1	2
Soup Powder, Pea & Ham	0	25	50	75	100	100+	Hot/Cold	1	2
Peas, Green	0	25	50	75	100	100+	Hot/Cold	1	2
Potatoes	0	25	50	75	100	100+	Hot/Cold	1	2
Sausages, Tomato & Onion	0	25	50	75	100	100+	Hot/Cold	1	2

[Go to Question 2.](#)

Menu C

Please circle the appropriate place for each item.

Item	Amount of Item Eaten					Preparation	Amount Provided
	None	Some	All	More than one issue			
Eg: Fish n' Chips	0	25	50	75	100	100+	(Hot/Cold)
Beef & Pasta	0	25	50	75	100	100+	Hot/Cold
Beef Stroganoff	0	25	50	75	100	100+	Hot/Cold
Beef Noodle Soup Powder	0	25	50	75	100	100+	Hot/Cold
Beverage powder - Tropical	0	25	50	75	100	100+	
Beverage Powder - Lemon	0	25	50	75	100	100+	
Beverage Powder - Lime	0	25	50	75	100	100+	
Shortbread Biscuit	0	25	50	75	100	100+	
Carrots	0	25	50	75	100	100+	Hot/Cold
Corn, Sweet	0	25	50	75	100	100+	Hot/Cold
Soup Powder, Chick. Noodle	0	25	50	75	100	100+	Hot/Cold
Fruit Pudding	0	25	50	75	100	100+	Hot/Cold
Apricot Jam	0	25	50	75	100	100+	
Blackcurrant Jam	0	25	50	75	100	100+	
Muesli Bar, Apricot & C'mut	0	25	50	75	100	100+	
Muesli Bar, Tropical	0	25	50	75	100	100+	
Potato Slices	0	25	50	75	100	100+	Hot/Cold
Rice	0	25	50	75	100	100+	Hot/Cold
Sausages & Spaghetti	0	25	50	75	100	100+	Hot/Cold

[Go to Question 2.](#)

Menu D

Please circle in the appropriate place for each item.

Item	Amount of Item Eaten					Preparation	Amount Provided	
	None	Some	All	More than one issue				
Eg: Fish n' Chips	0	25	50	75	100	100+	Hot/Cold	1 (2) 3
Beef & Blackbean	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beef Kai Si Ming	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beef Noodle Soup Powder	0	25	50	75	100	100+	Hot/Cold	1 2 3
Beverage powder - Orange	0	25	50	75	100	100+		1 2 3
Beverage Powder - Tropical	0	25	50	75	100	100+		1 2 3
Beverage Powder - Lime	0	25	50	75	100	100+		1 2 3
Scotch Finger Biscuit	0	25	50	75	100	100+		1 2 3
Carrots	0	25	50	75	100	100+	Hot/Cold	1 2 3
Corn, Sweet	0	25	50	75	100	100+	Hot/Cold	1 2 3
Soup Powder, Chick. Noodle	0	25	50	75	100	100+	Hot/Cold	1 2 3
Fruit Pudding	0	25	50	75	100	100+	Hot/Cold	1 2 3
Blackberry Jam	0	25	50	75	100	100+		1 2 3
Raspberry Jam	0	25	50	75	100	100+		1 2 3
Muesli Bar, Forest Fruit	0	25	50	75	100	100+		1 2 3
Muesli Bar, Tropical	0	25	50	75	100	100+		1 2 3
Potato Slices	0	25	50	75	100	100+	Hot/Cold	1 2 3
Rice	0	25	50	75	100	100+	Hot/Cold	1 2 3
Spaghetti & Meatballs	0	25	50	75	100	100+	Hot/Cold	1 2 3

Go to Question 2.

When Consumed	Rating of Item									Food Not Eaten
	B - Breakfast	L - Lunch	S - Snack	D - Dinner	1. Dislike Extremely	2. Dislike Very Much	3. Dislike Moderately	4. Dislike Slightly	5. Neither Like / Dislike	
(B) L	1	2	3	4	5	6	7	8	9	1 2 3
B L	1	2	3	4	5	6	7	8	9	1 2 3
B L S	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3
B L S D	1	2	3	4	5	6	7	8	9	1 2 3

Menu E

Please circle in the appropriate place for each item.

Item	Amount of Item Eaten	Preparation	Amount Provided
	None Some All More than one issue		1. Not Enough 2. Just Right 3. Too much
Eg: Fish n' Chips	0 25 50 75 100 100+	Hot/Cold	1 (2) 3
Baked Beans	0 25 50 75 100 100+	Hot/Cold	1 2 3
Chicken, Pasta & Vegetables	0 25 50 75 100 100+	Hot/Cold	1 2 3
Soup Powder, Chick. Noodle	0 25 50 75 100 100+	Hot/Cold	1 2 3
Beverage powder - Orange	0 25 50 75 100 100+		1 2 3
Beverage Powder - Tropical	0 25 50 75 100 100+		1 2 3
Beverage Powder - Lime	0 25 50 75 100 100+		1 2 3
Scotch Finger Biscuit	0 25 50 75 100 100+		1 2 3
Carrots	0 25 50 75 100 100+	Hot/Cold	1 2 3
Corn, Sweet	0 25 50 75 100 100+	Hot/Cold	1 2 3
Soup Powder, Tomato	0 25 50 75 100 100+	Hot/Cold	1 2 3
Fruit Pudding	0 25 50 75 100 100+	Hot/Cold	1 2 3
Raspberry Jam	0 25 50 75 100 100+		1 2 3
Strawberry Jam	0 25 50 75 100 100+		1 2 3
Muesli Bar, Forest Fruits	0 25 50 75 100 100+		1 2 3
Muesli Bar, Tropical Fruits	0 25 50 75 100 100+		1 2 3
Salmon & Pasta Mornay	0 25 50 75 100 100+	Hot/Cold	1 2 3
Peas, Green	0 25 50 75 100 100+	Hot/Cold	1 2 3
Potatoes	0 25 50 75 100 100+	Hot/Cold	1 2 3

Go to Question 2.

When Consumed				Rating of Item									Food not Eaten		
B - Breakfast	L - Lunch	S - Snack	D - Dinner	1. Dislike Extremely	2. Dislike Very Much	3. Dislike Moderately	4. Dislike Slightly	5. Neither Like / Dislike	6. Like Slightly	7. Like Moderately	8. Like Very Much	9. Like Extremely	1. Discarded	2. Swapped	3. Left unused
(B)	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3
B	L	S	D	1	2	3	4	5	6	7	8	9	1	2	3

2. The items in the following table are common to all menus. Please answer questions

Please circle in the appropriate place for each item.

regardless of the menu used.

3. Do you or have you supplemented the Combat Ration pack with additional food items?
YES / NO

If you answered "YES" please give details.

Food Item	Amount Carried	Amount Eaten
<i>Eg: Instant Noodles</i>	<i>2 X 150 g packets</i>	<i>1 X 150 g</i>
.....
.....
.....
.....
.....

4. Are there any other items that should be included in the CR5M? YES / NO

Please give details:

Item	Reason for the inclusion
<i>Eg: Corn Flakes</i>	<i>I would like this as a breakfast item.</i>
.....
.....
.....
.....
.....
.....

5. List any items you discarded from CR5M and give reason why.

<u>Item</u>	<u>Reason discarded</u>
.....
.....
.....
.....
.....
.....
.....

6. List any items you traded with others in the CR5M.

Item Traded	Item Received
.....
.....
.....
.....
.....
.....

7. Please mark in the appropriate box.

The retort pouch when compared to the can:

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Is easier to open	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is difficult to heat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heats quicker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is easier to carry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is more robust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is easier to dispose of after use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provides food of better appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does not provide food with better taste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Retort Pouches are better than cans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How did you heat the retort pouch? Please mark the appropriate box.

Did not heat	<input type="checkbox"/>
Opened the pouch, placed in hot/boiling water in the section cook set	<input type="checkbox"/>
Placed the pouch (unopened) in hot/boiling water in the section cook set	<input type="checkbox"/>
Opened the pouch, placed in cold water in the section cook set and heated	<input type="checkbox"/>
Placed the pouch (unopened) in cold water in the section cook set and heated	<input type="checkbox"/>

9. Refer to the following statements on CR5M:

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The CR5M packaging is strong enough for field use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is too much waste material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The four plastic containers with lids should be replaced by fibreboard containers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. How did you prepare and eat CR5M:

Meal	Individually	As a group (How many?)
Breakfast	<input type="checkbox"/>	_____
Lunch	<input type="checkbox"/>	_____
Dinner	<input type="checkbox"/>	_____

11. Do you believe that CR5M satisfies your food requirement (filling, variety, morale, etc)?

YES / NO

Please explain.

.....
.....
.....
.....
.....
.....
.....

12. Please write any comments or suggestions, which may help in improving the Combat Ration Five Man.

.....
.....
.....
.....
.....
.....
.....

Thank you for taking the time to complete this questionnaire. Your cooperation is invaluable in helping us to improve this ration packs so that it meets your future requirements.

K:\docs\foodtech\surveys\CR5M Questionnaire Sep 98

B.2. CR5M Acceptability Survey

CR5M/Bulk Feeding Acceptability Survey

Many concerns have been raised about the acceptability of the current Combat Ration Five Man (CR5M) by members of the defence force. As a frequent user of ration packs, we would like your advice on what changes are needed to improve the CR5M.

Instructions

Use a blue/black pen to answer questions. Answer the questions by either colouring in the relevant circles or by writing an answer in your own words, following the question, in the area provided.

Example :

In the following example the respondent has consumed "Some" of the Anzac muesli bar and given it an acceptability rating of "Neutral".

Food Item	Amount Consumed			Acceptability Rating				
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good
Anzac muesli bar	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you make a mistake put a cross through the first answer and colour in the correct answer.

Example	1	2	3
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Questions

**Use your experience of the CR5M during this exercise to answer the following questions.
Your answers will be strictly confidential.**

Your Age _____	Gender	<input type="radio"/> Male	Today's Date	/ /20
Your Unit _____		<input type="radio"/> Female	Sub Unit	_____

Q.1. How long, in days, was this exercise? _____ days
(Please use numbers for your answer)

Q.2. Did you consume both CRP and fresh food during this exercise? Yes
 No **go to Q.4.**

Q.3. How many days were you eating fresh food? _____ days
(Please use numbers for your answer)

Q.4. How many days were you eating CR5M? _____ days
(Please use numbers for your answer)

Q.5. When eating the CR5M, how many people in your crew or group usually ate together? _____ people
(Please use numbers for your answer)

Q.6. What was your main activity while consuming only the CR5M?
 Patrolling in the field
 Other work in the field (eg. tank crew)
 Base area / static location duties
 Other

Please State: _____

Q.7. On average, how many hours per day did you do this main activity?

0-3 hrs 4-5 hrs 6-7 hrs 8-9 hrs 10-11 hrs 12-13 hrs 14-15 hrs 16 + hrs

Q.8. Choose ONE of the following that best describes the climate you were in for most of this exercise

Hot
 Mild
 Cold

Q.9. Were you involved in mounted operations?

Yes
 No **go to Q.12.**

Q.10. Was the vehicle air conditioned?

Yes
 No

Q.11. What was the climate like in the vehicle?

Hot
 Mild
 Cold

Q.12. Only answer the questions relevant to the Main Meal Items available to you on this exercise.

Main Meal Items	Amount Consumed			Acceptability Rating					
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good	
Baked Beans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1
Beef & Blackbean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2
Beef & Gravy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3
Beef & Pasta	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4
Beef & Vegetables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5
Beef Kai Si Ming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6
Beef, Minced, Savoury, with Veg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7
Beef Satay	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8
Beef Stroganoff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9
Beef, Minced, with Spaghetti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10
Carrots, sliced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11
Chicken Curry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12
Chicken Satay	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13
Chicken, Pasta & Veg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14
Frankfurters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15
Lamb & Rosemary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16
Peas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17
Potatoes, sliced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18
Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19
Sausages & Spaghetti	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20
Sausages, Tomato & Onions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21
Spaghetti & Meatballs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22
Sweet Corn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23

Q.13. Do you have any comments on any of the Main Meal items? (eg. Beef & gravy, too runny)

Q.14. Is it important to you to be able to heat your Main Meals? Yes No

Q.15. How often were you able to heat your Main Meals? Always Sometimes Never

Q. 16. Were your Main Meals prepared:

Always Sometimes Never

By one group member for the entire group

Individually

By Catering Staff

Q.17. Would you prefer individual portions of the main meals? Yes No No Opinion

Q.18. What cooking equipment was available during this exercise? Individual cooking set Section cooking set Mobile kitchen Other

Please State: _____

Q. 19. Only answer the questions relevant to the Snack Items available to you on this exercise.

<u>Snack Items</u>	<u>Amount Consumed</u>			<u>Acceptability Rating</u>					1
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good	
Biscuit - Crispbread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1
Biscuit - Jam Sandwich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2
Biscuit - Ginger Nut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3
Biscuit - ANZAC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4
Biscuit - Scotch Finger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5
Biscuit - Shortbread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6
Chocolate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7
Cheese, cheddar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8
Chewing Gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9
Two Fruits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10
Peaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11
Pears	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12
Muesli Bar - ANZAC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13
Muesli Bar - Apricot & Coconut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14
Muesli Bar - Forest Fruits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15
Muesli Bar - Tropical Fruit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16

Q.19. continued

<u>Snack Items</u>	<u>Amount Consumed</u>			<u>Acceptability Rating</u>					1 2 3 4 5 6 7 8
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good	
Soup Powder - Beef	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1
Soup Powder - Beef Noodle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2
Soup Powder - Chicken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3
Soup Powder - Chick. Noodle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4
Soup Powder - Savoury Veg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5
Soup Powder - Tomato	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6
Soup Powder - Pea & Ham	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7
Soup Powder - French Onion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8

Q.20. If consumed, how do you consume your soups?

Hot
 Cold
 Both Hot & Cold

Q.21. The number of Snack Items supplied in the CR5M is

Not Enough
 OK
 Too Many

Q.22. The number of Sweet items supplied in the CR5M is

Not Enough
 OK
 Too Many

Q.23. Do you think there should be more Savoury items (e.g. dry biscuits)?

Yes
 No

Q.24. Do you have any comments on any of the Snack Items?

Q.25. Only answer the questions relevant to the Drink Items available to you on this exercise.

<u>Drink Items</u>	<u>Amount Consumed</u>			<u>Acceptability Rating</u>					1 2 3 4 5 6 7 8
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good	
Chocolate Drink Powder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1
Instant Coffee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2
Beverage Powder - Lemon & Lime	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3
Beverage Powder - Mixed Berry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4
Beverage Powder - Orange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5
Beverage Powder - Raspberry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6
Beverage Powder - Tropical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7
Tea	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8

Q.26. The number of Sport Beverage Powders supplied in the CR5M is

Not Enough
 OK
 Too Many
 No Opinion

Q.27. The number of Hot Drinks supplied in the CR5M is

Not enough
 OK
 Too Many
 No Opinion

Q.28. Do you have any comments on any of the Drinks?

Q.29. Only answer the questions relevant to the items available to you on this exercise.

<u>Other Items</u>	Amount Consumed			Acceptability Rating					1
	None	Some	All	Very Bad	Bad	Neutral	Good	Very Good	
Fruit Spread - Apricot	<input type="radio"/>	2							
Fruit Spread - Blackberry	<input type="radio"/>	3							
Fruit Spread - Blackcurrant	<input type="radio"/>	4							
Fruit Spread - Raspberry	<input type="radio"/>	5							
Fruit Spread - Strawberry	<input type="radio"/>	6							
Fruit Pudding	<input type="radio"/>	7							
Butter Concentrate	<input type="radio"/>	8							
Curry Powder	<input type="radio"/>	9							
Sweet Chilli Sauce	<input type="radio"/>	10							
Soy Sauce	<input type="radio"/>	11							
Tomato Ketchup	<input type="radio"/>	12							
Tobasco Sauce	<input type="radio"/>	13							
Vegetable Extract	<input type="radio"/>	14							
Sweetened Condensed Milk	<input type="radio"/>	15							
Matches	<input type="radio"/>								

Q.30. If used, how do you use the vegetable extract?

	Always	Sometimes	Never
As a Brew	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a Spread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a Flavouring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.31. Do you have any comments on any of the Other Items?

General Questions about the CR5M

Q.32. Do you think there is enough variety between the 5 menus of the CR5M? Yes No

Q.33. Do you think there is a lack of specific breakfast items in any of the menus? Yes No

Q.34. Did you take extra food/drinks (Jack Rations)? Yes No **go to Q.38.**

Q.35. Did you take any of the following items as Jack Rations?

Jack Ration Item	Yes	No	
Noodles (e.g. 2 minute)	<input type="radio"/>	<input type="radio"/>	1
Pasta	<input type="radio"/>	<input type="radio"/>	2
Rice Meal Packs	<input type="radio"/>	<input type="radio"/>	3
Dried/processed meats (e.g. beef jerkey, salami)	<input type="radio"/>	<input type="radio"/>	4
Canned Fish	<input type="radio"/>	<input type="radio"/>	5
Canned Fruit	<input type="radio"/>	<input type="radio"/>	6
Dry Biscuits (e.g. crispbread/vitawheat)	<input type="radio"/>	<input type="radio"/>	7
Flavoured Biscuits (e.g. barbecue shapes)/Chips	<input type="radio"/>	<input type="radio"/>	8
Jubes/Jelly Babes etc	<input type="radio"/>	<input type="radio"/>	9
Boiled Lollies (barely sugar)	<input type="radio"/>	<input type="radio"/>	10
Chocolate Bars (e.g. snickers)/Blocks (e.g. fruit & nut)	<input type="radio"/>	<input type="radio"/>	11
Dried Fruit & Nuts	<input type="radio"/>	<input type="radio"/>	12
Packet Soups	<input type="radio"/>	<input type="radio"/>	13
UHT Drinks (Milk/Juice)	<input type="radio"/>	<input type="radio"/>	14
Muesli Bars/ Breakfast Bars	<input type="radio"/>	<input type="radio"/>	15
Cereal	<input type="radio"/>	<input type="radio"/>	16
Muesli/oats and powdered milk mixes	<input type="radio"/>	<input type="radio"/>	17
Fruit Bars	<input type="radio"/>	<input type="radio"/>	18
Other	<input type="radio"/>	<input type="radio"/>	19

Q.36. Do you have any special dietary needs? (eg. gluten intolerant, allergy to nuts, vegetarian, religious beliefs etc)

Yes
 No **go to Q.38.**

Q.37. What are they?

Q.36. Do you think there is a need for a Hot Weather ration pack, containing light snacks or cold consumable meals rather than main meals that require heating?

Yes
 No
 Not sure

Q.37. If you took part in mounted operations, is the size of the CR5M a problem?

Yes
 No
 Not Applicable

Q.38. Noise, gloss, too hard to open, inadequate seals, rubbish removal and lack of camouflage are common problems identified with the current CRP packaging. Do you have any problems with the current CR5M packaging?

Yes
 No **go to Q.40.**

Q.39. What are they?

Q.40. Overall, how would you rate the CR5M in terms of meeting your needs for food during this exercise?

Very Bad Bad Neutral Good Very Good

Q.41. Do you have any further comments that you would like to make about the CR5M?

**Thank you for participating in this survey.
Your responses will be invaluable to our research.**

B.3. CR5M Acceptability and Service Suitability Survey

CR5M Acceptability and Serviceability Survey

To improve ration feeding we would like your assistance in establishing any current problems with the CR5M and what changes could be made to make the CR5M more useful to your unit. Please answer all of the following questions on the CR5M and group feeding as they relate to your unit.

Name: _____	Date: / / 20
Position: _____	Unit: _____

Please use a blue/black pen to answer all questions.

Fill in one circle relevant to your answer for the following questions.

Q.1. Are the personnel under your command

- Infantry
- Mounted/mechanised
- Artillery
- Other

Please state: _____

Q.2. Has your unit used the CR5M in the last 6 months?

- Yes
- No go to Q.4.

Q.3. How many did your unit use in 6 months?

Q.4. If you had 8 people rationed for 3 days (a requirement for $8 \times 3 = 24$ rations in total), would you issue:

- 2 CR5M each day
- 5 CR5M (total of 25 rations) for the 3 days
- A combination of CR5M and CR1M
- Other

Please state: _____

Q.5. In its present form, is the CR5M suitable for use with your unit/s?

- Yes
- No go to Q.7.

Q.6. Could the current CR5M be improved to meet the needs for use with your unit/s?

- Yes
- No go to Q.8.

Q.7. How could the current CR5M be improved to make it suitable for use with your unit?

Please mark as many options as appropriate.

- Change the configuration
- Substitute bulk meal pouches with individual meal pouches
- Decrease size
- Decrease weight
- Remove the need for group cooking
- Other

Please state: _____

Q.8. Do you think the current CR5M creates excessive waste?

- Yes
- No go to Q.10, page 2.

Questions 9 to 12 relate to group feeding and not solely to the CR5M.

Q.9. Please indicate the importance of each option in its contribution to waste associated with the CR5M by filling in the appropriate circles.

	Importance		
	Most	Fairly	Least
Excess packaging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Type of packaging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too much food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Configuration of the CR5M	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food is not liked	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Don't have enough time to prepare main meals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Please state: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.10. Do you think there is a need for a group feeding ration (GFR)? Yes
 No **go to Q.13, page 4.**

Q.11. Which configuration of a group feeding ration best suits your unit's tactical needs?

3 4 5 6 7 8 9 10 >10

Please give reason for answer:

Q.12. How much do you agree with the following statements in relation to your units requirements for a group feeding ration (GFR) including the CR5M. Please indicate how much you agree by filling in the relevant circles.

Under the Importance heading, please fill in the relevant circles to indicate each statement's level of importance to your units requirements for a GFR.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Importance		
						Most	Fairly	Least
Must be light weight	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bread must be available as a ration supplement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Main meals must be easily prepared by one person for the whole group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easily divided into individual meals/items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food items other than drinks must not require water for preparation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Main meals can be eaten cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Main meals able to be prepared by catering staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Must not create a lot of waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Must allow group members to prepare and eat meals individually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Must be complete, not requiring a supplement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Must be very compact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q.13. What type of ration would be more suitable to the tactical needs of your unit?

- Bulk pack, prepared by catering staff
- CR1M
- PR1M
- Combination of CR1M/PR1M
- Other
Please state: _____

Q.14. Are there occasions when the CR1M or PR1M would NOT be a suitable replacement for the CR5M?

- Yes **go to Q.15**
- No
- Not Sure

Q.15. On what occasions would the CR1M or PR1M NOT be suitable?

You have finished the survey. Thank you for your participation. Your results will be invaluable to our research.

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Ration packs, group feeding, acceptability, consumption			
19. ABSTRACT This report details the results from three studies conducted on the acceptability and service suitability of the Combat Ration Five Man (CR5M), ADF's only group-feeding ration pack. Current information on the cost of production and current use of the CR5M and the Combat Ration One Man (CR1M) are also included. An important finding of these studies is that general acceptability, based purely on individuals' preferences for a food item, is not the only factor determining whether that food will be consumed. Behavioural factors, such as soldier attitude and meal occasion, and environmental factors, such as meal location and eating conditions, are also important. The most frequently requested changes to the CR5M are to substitute bulk meal pouches with individual meal pouches and to remove the need for group cooking. Both changes would effectively convert the CR5M into five bulk-packed CR1Ms. A need for a change to the configuration of the CR5M was indicated by respondents in all of the surveys. No single configuration was identified that best suits most users. Current usage rates (by units), consumption levels (by individual ADF members) and the opinions expressed by respondents in all surveys suggest that the CR5M is not fully meeting the perceived needs of the ADF. Support for the universal use of a combination of CR1M and Patrol Ration One Man (PR1M) in place of a group feeder was evident in all surveys. Rationing of units identified as users of the CR5M could be achieved with a combination of CR1M and PR1M. It is anticipated that the universal use of a CR1M/PR1M combination by all units would be more cost effective than the current system.			